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PROCEEDINGS OF THE
Thirty-Seventh Annual Meeting
OF THE
Illinois State Dairymen's
Association

HELD AT
ELGIN, ILLINOIS
January 16, 17, 18 and 19,
1911.

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Letter of Transmittal.

Office of Secretary,
Illinois State Dairymen's Association,
Chicago, Ill., 1911.

To His Excellency, Charles S. Deneen, Governor of the State
of Illinois:

I have the honor to submit the official report of the Illinois
State Dairymen's Association, containing the addresses, papers,
and discussions at its thirty-seventh annual meeting, held at
Elgin, Illinois, January 16, 17, 18, and 19, 1911.

Respectfully,

GEO. CAVEN, Secretary.

582169

List of Officers.

President—

J. P. MASON, Elgin.

Vice President—

L. N. WIGGINS, Springfield.

Directors—

J. P. MASON, Elgin.

CHAS. GILKERSON, Marengo.

F. G. AUSTIN, Effingham.

E. SUDENDORF, Clinton.

JOSEPH NEWMAN, Elgin.

L. N. WIGGINS, Springfield.

JOHN LYNCH, Olney.

Secretary—

GEO. CAVEN, Chicago.

Treasurer—

CHAS. FOSS, Cedarville.

By-Laws of the Illinois State Dairymen's Association.

Officers.

Section 1.—The officers of the Association shall consist of a President, Vice President, Secretary, Treasurer and Board of Directors, composed of seven members, of whom the President and Vice President of the Association shall be members and the President ex-officio Chairman.

Duties of the President.

Sec. 2.—The President shall preside at the meetings of the Association and of the Board of Directors. It shall be his duty, together with the Secretary of the Board of Directors to arrange a program and order of business for each regular annual meeting of the Association and of the Board of Directors, and upon the written request of five members of the Association it shall be his duty to call special meetings. It shall be his further duty to call on the State Auditor of Public Accounts for his warrant on the State Treasurer, for the annual sum appropriated by the Legislature for the use of this Association, present the warrant to the Treasurer for payment, and on receiving the money receipt for the same, which he shall pay over to the Treasurer of the Association, taking his receipt therefor.

Duties of the Vice President.

Sec. 3.—In the absence of the President his duties shall devolve upon the Vice President.

Duties of the Secretary.

Sec. 4.—The Secretary shall record the proceedings of the Association and of the Board of Directors. He shall keep a list of the members, collect all the moneys due the Association (other than the legislative appropriations), and shall record the amount with the name and postoffice address of the person so paying, in a book to be kept for that purpose. He shall pay over all such moneys to the Treasurer, taking his receipt therefor. It shall also be his duty to assist in making the program for the annual meeting and at the close of the said meeting compile and prepare for publication all papers, essays, discussions and other matter worthy of publication, at the earliest day possible, and shall perform such other duties pertaining to his office as shall be necessary.

Duties of the Treasurer.

Sec. 5.—The Treasurer shall, before entering on the duties of his office, give a good and sufficient bond to the Directors of the Association, with one or more sureties, to be approved by the Board of Directors, which bond shall be conditioned for a faithful performance of the duties of his office. He shall account to the Association for all moneys received by him by virtue of said office and pay over the same as he shall be directed by the Board of Directors. No moneys shall be paid out by the Treasurer except upon an order from the Board, signed by the President and countersigned by the Secretary. The books or accounts of the Treasurer shall at all times be open to the inspection of the members of the Board of Directors, and he shall, at the expiration of his term of office, make a report to the Association of the conditions of its finances, and deliver to his successor the books of account together with all moneys and other property of the Association in his possession or custody.

Duties of the Board of Directors.

Sec. 6.—The Board of Directors shall have the general management and control of the property and affairs of the Association, subject to the By-Laws.

Four members of the Board shall constitute a quorum to do business.

The Board of Directors may adopt such rules and regulations as they shall deem advisable for their government, and may appoint such committees as they shall consider desirable.

They shall also make a biennial report to the Governor of the State of the expenditures of the moneys appropriated to the Association, and arrange the program and order of business for the same.

Election of Officers.

Sec. 7.—The President, Vice President and Board of Directors shall be elected annually by ballot at the first annual meeting of the Association.

The Treasurer and Secretary shall be elected by the Board of Directors.

The officers of the Association shall retain their offices until their successors are chosen and qualify.

A plurality vote shall elect.

Vacancies occurring shall be filled by the Board of Directors until the following annual election.

Membership.

Sec. 8.—Any person may become a member of this Association by paying the Treasurer such membership fee as shall from time to time be prescribed by the Board of Directors.

Quorum.

Sec. 9.—Seven members of the Association shall constitute a quorum for the transaction of business but a less number may adjourn.

Annual Assessment.

Sec. 10.—One month prior to the annual meeting in each year the Board of Directors shall fix the amount, if any, which may be necessary to be paid by each member of the Association as an annual due.

Notice of such action must be sent to each member within ten days thereafter, and no member in default in payment thereof shall be entitled to the privileges of the Association.

Amendment of By-Laws.

Sec. II.—These By-Laws may be amended at any annual meeting by a vote of not less than two-thirds of the members present. Notice of the proposed amendment must be given in writing, and at a public meeting of the Association, at least one day before any election can be taken thereon.



INTRODUCTION.

Geo. Caven, Secretary.

Every expectation of making the thirty-seventh annual convention of the Illinois State Dairymen's Association, in Elgin, January 16, 17, 18 and 19, 1911, a record meeting was more than realized.

An attendance of 500 to 800 at the opening meeting Monday night, fully 1,000—nearly all dairy farmers—at the Tuesday afternoon session, and even a greater attendance at the sessions Wednesday and Thursday, tell the story of this convention.

It was the first time in the history of the Association that dairy cattle formed a part of the exhibit. Some thirty head were shown and included all prize cattle, the Holsteins, of course, predominating, as they lead among Northern Illinois herds.

The Glee Club of the Elgin high school furnished music at the evening sessions. Speakers for Monday evening, the opening session, were Mrs. Scott Durand, of Lake Forest, and S. B. Shilling, of Chicago. The latter's talk was general, he having been called upon because of the failure of one of the announced speakers to arrive.

Mrs. Durand devoted much of her time to the tuberculin test and the production of clean milk.

The formal opening of the convention came Tuesday morning, when, with the audience space well filled, Rev. C. S. Thomas asked a blessing and Mayor Fehrman spoke a few words of welcome. Charles Gilkerson, of Marengo, responded. President L. N. Wiggins then read his annual address.

Completing Tuesday's Program.

Committees on resolutions and memberships were appointed, after which short addresses were made by Judge John Lynch of Olney, and others.

S. B. Shilling, of Chicago, spoke at the opening of the Tuesday afternoon session and gave the dairymen excellent doctrine to be put into practice.

Hugh G. Van Pelt, in charge of the dairy extension work in Iowa, took from the exhibit a Holstein cow, placed her on the stage and pointed out for the edification of the audience the points that distinguish the dairy animal. He then brought in turn the representatives of the different classes exhibited before the audience, described each animal and awarded the ribbons. This was an extremely interesting session.

Tuesday evening, E. Davenport, dean of the College of Agriculture, University of Illinois, lectured on the needs of the college. He pointed out how present means were inadequate to meet the demands for agricultural knowledge in the state.

The citizens entertained the members of the Association, after Tuesday evening's lecture, at the Elk's club rooms. Hot roast beef, cheese, coffee, etc., were served, and, by the way of entertainment, several vaudeville sketches were given.

Wednesday a Big Day.

The Wednesday morning session was opened by A. J. Glover, of Ft. Atkinson, Wis., who discussed dairying in its relation to soil fertility. Mr. Glover reduced his talk to short words and phrases, adding to its interest and making the subject clear to all. It was a plain but convincing presentation of the subject and had an audience room crowded with eager listeners.

At the afternoon session, J. E. Dorman discussed silos and ensilage. Dr. A. T. Peters, of the Illinois State Board of Live Stock Commissioners, discussed diseases of the udder, and W. W. Marple, of Muncie, Ind., gave an excellent address, relating mainly to the care of milk.

Dean Russell, of the College of Agriculture, University of Wisconsin, spoke Wednesday morning, taking for his subject the economical side of this tuberculosis problem. The dean is a recognized authority on this subject, not only in this country, but wherever attention is given to this disease among cattle.

The election was held Wednesday afternoon. It had been announced in the program for Thursday, but the assurance that the day would be crowded with other matters was the reason for advancing the business session.

Old officers were re-elected to the directory. Mr. Wiggins declined to run again as president, he having served in that position five years, and J. P. Mason, of Elgin, was chosen president, with Mr. Wiggins vice president. These, with John Lynch, of Olney, E. Sudendorf, of Clinton, Joseph Newman, of Elgin, Charles Gilkerson, of Marengo, and A. F. Jansen compose the directory.

Tuberculosis Demonstration.

The tuberculosis demonstration was a complete success. It was given at the plant of the Kerber Packing Company. Special street cars took the crowd out to the plant at 9:30 a. m. and full 500 saw the killing. Five animals, two that had not reacted to the tuberculin test and three that had reacted, were killed. The two showed no signs of the disease; but in the case of the three reacting cows there could be no doubt. The infected parts were taken back to the Coliseum, where, in the afternoon and before an audience of 1,000 or more, Dr. Scott, of Peoria, who conducted the demonstration, made a statement of conditions as found in the post mortem; then Dean Russell, of Wisconsin College of Agriculture, took the platform to answer questions and kept the audience for two hours and a half. J. P. Mason gave an address on profitable dairying, the committee on resolutions reported, and prize winners in the contest were announced. This closed the convention, adjournment being taken at 5 o'clock Thursday afternoon, with the audience space crowded and the whole Coliseum thronged with people.

The Exhibits.

The Coliseum was well filled with exhibits, which included some thirty dairy animals, mostly Holsteins. There was one Dutch-Belt, several Jerseys and Guernseys. Among the Holsteins were prize animals, including winners at the last state fair and the National Dairy Show. Exhibitors of dairy animals were E. W. Wing, J. L. Mason, and Frank Hopp, of Elgin; James Dorsey, of Gilberts; T. E. Getzelman, of Hampshire, and Robert E. Haeger, of Algonquin.

The exhibit of creamery and dairy machinery and supplies was good, occupying all the available space. Booths were occupied by J. B. Ford Co., showing their Wyandotte Cleaner and Cleanser; De Lavel Separator Co., showing hand separators; Creamery Package Manufacturing Co., showing machines, tubs, etc.; Vermont Farm Machine Co., showing U. S. separators; Jones Refrigerating Machine Co., showing one of their refrigerators; International Harvester Co., showing separators, an automobile truck for farm use and particularly for making cream and milk deliveries; A. H. Barber Creamery Supply Co., showing the B.-L.-K. milkers and other machines, including Simplex separators; Kimball, Dietrich Hardware Co., showing Sharples Separators; Elgin Butter Tub Co., with a good line of their tubs; Morton Salt Co.; Britton & Dougherty, of Elgin, agents for the Kent Manufacturing Co., of Fort Atkinson, Wis., who put in the stanchions and model stalls for the cows in the exhibit, and showing besides a silo filler mounted on a wagon truck; Jensen Manufacturing Co., who instead of machines had a nicely decorated booth with large pictures of the various machines that compose the company's specialties.

A number of the local firms had exhibits, making in all a most attractive show.

PROCEEDINGS
OF THE
Thirty-Seventh Annual Convention
OF THE
Illinois State Dairymen's Association
HELD AT
Elgin, Illinois, January 16, 17, 18 and 19, 1911

Monday Evening, January 16, 1911.

Mrs. Scott (Grace) Durand, Lake Forest, Ill.

Mr. Chairman, Ladies and Gentlemen:—

I did not expect to speak here tonight until a few days ago and have no written address, but I presume that really one would rather hear one speak than listen to a regularly written address at times. It is a great pleasure to me to be here with you, but I am going to give you the introduction of an address that I delivered the other day which I think is fitting at this place. If I do not make myself heard in the rear of the hall, I wish you would tell me.

Ladies and gentlemen, when a woman is invited to speak at such a meeting as this, before a body of men whose business pursuits affect the very vitality of our nation, honor is given to my sex and I am truly proud of it. I appreciate more fully the privilege of speaking at such a meeting than any of you do in listening to me.

There is no longer found the industry in the political and social world for either the son or daughter of the nation. A man or woman who does not throw aside the selfish life, that of living for herself or himself alone, who does not live for the greater good and benefit of the people at large in all that pertains to a wholesome existence is not worthy of the patriarchs of our country. I don't believe, in the days of the Revolution or of the Civil War, that these were years of greater service and consequence than those that present themselves to us today. Our young nation has pushed ahead with such strides that our people are apt to become satisfied. Our greatest need rests in the one word "honesty." It is no longer the Republican or the Democrat, the Catholic or the Protestant, the black or the white, it is the honest man against the dishonest man, fair methods against unfair methods, frauds against justice in competition. It is arousing the conscience of our whole people to such an extent that politics may be purged of its corruption and society of its impurities, that the least among them may be protected. It is the duty of those, who, through experience or fortunes have learned a better way to impart that better way to those who need the knowledge, and it was with such thoughts that I strove to produce clean and pure milk.

Constantly, for years, before me were the unkept dairy cows covered with filth. Out of the large number a great percentage are merely boarders; then the picture of the average cow stable with dirty milk utensils, the ignorance in feeding the dairy cow and sometimes the harsh treatment they receive at the hands of the help, the uninviting condition of the surroundings, the badly washed utensils and careless handling of the same, and lastly the importance of a proper price.

Now as to the matter of the City Milk Supply. I am going to give you, after six years of dairy farming—first let me say that for the first time in those six years I do not own a dairy cow. My barns burned down and I am taking three or four months while I am rebuilding, and I can look back on these six

years and give you tonight my impressions and what has come to me most forcibly in the production of a clean milk for the city market.

In the first place I want to say, when I went into dairy farming it seemed to me that there was no work in the world where I could be of more use than that of learning the business of dairy farming. I took it up with the object of knowing what the proper price should be, and when Mr. Mason introduced me tonight as getting so much for my milk, will say that I have demonstrated for myself that I get too much for my milk; that milk can be produced with a low bacteria, perfectly safe for any delicate child to drink and delivered in the City of Chicago for at least three or perhaps four cents less than what I was paid for it.

Now, I started in, not as the wife of a wealthy man to draw upon him for all I wished to use, but I was limited to \$2,500.00, all that my husband would risk on me and I started in in a modest way, I might say a humiliating way, for the reason that with that \$2,500.00, when I got my first cows paid for and my first equipment, I did not have much left, but got a few sheds up and when the Chicago papers came out most gallantly, I was a little bit ashamed when they started to come to see this wonderfully sanitary dairy farm. The milk I bottled in the most ordinary way, but the grit was there and I was bound to go on.

The first sad experience that I had was when I realized that there was such a thing as someone who probably did not want me to succeed. When suddenly I received notice from some of my customers that my milk was very foul, that there were pus cells and pus found in my milk. I did not sleep that night. They notified me that the laboratory had made an analysis of my milk and that I was killing all the babies. I think I grew ten years older that night, and I called upon Mr. Gurler and told him about it and he said he had had similar experiences and for me to do nothing, but the next morning I sent two samples taken side by side, one to Professor Hastings of the University of Wisconsin at Madison and the other sample to the bacteriologist

in Chicago, and his report stated that I had pus cells in my milk. I telegraphed Professor Hastings to watch out for pus cells, this was on Thursday morning, the next afternoon I received the report from the Chicago office—I could get one by wireless as quick as that—the pus cells were still there. Two or three days later, I was thinking it was taking Professor Hastings quite a while, I received his report stating that there were no pus cells, "There is nothing but white blood corpuscles; anyone who says that they are pus cells does not know what they are talking about." I have since learned that you cannot tell in any event without examining the udder of the cow. I then interviewed the Chicago office and asked them what right their bacteriologist had to say that my milk had pus cells? When I first went in I looked very harmless, but I was prepared for him because I had good authority. I said, "What is your authority?" He said he himself was authority. Now I have the written evidence in that case, whether I shall ever use it in time or not, I do not know, but that was my first experience in running up against anything of that sort.

I employed two managers for the first seventeen months and as I was losing money at such a rate with the managers, I made up my mind I would not have a cow left inside of two or three months if I did not give up the managers and go into it myself, so I rolled up my sleeves, discharged the manager and went into it myself.

I found again that my milk was terrible; I was having 500,000 to a million bacteria. I did not know at the time that my discharged manager had gone in there, I did not know what was the matter. I finally thought it was suspicious, so I put a sample of milk from another man's dairy into a "Crabtree" bottle and I found that the word "Crabtree" made the word "bacteria."

I have learned, during the production of clean milk, that the hardest thing of all is to come up against this unfair and tricky competition and I am here tonight, gentlemen, and am very glad to be here before the Illinois State Dairymen's Asso-

ciation because I believe that it belongs to you gentlemen to go into all these questions for your product.

I also found that it was impossible to have my milk recommended by certain physicians, my agent handling the milk for me wished me to go and see the physicians, thought it was quite the thing to do to go and jolly them up. I said I will not jolly up anybody, if I am to produce clean milk it is up to the physicians to come and see me and my methods of production, consequently I was not very popular with the physicians. "Crabtree" milk was rejected everywhere that it could be rejected, but going alone one day I was persuaded to go into the office of a prominent physician; he had been recommending the Gurler milk. Mr. Gurler was to sell out the first of April and I asked him if there had been any bacteria count in the Gurler milk. He said "No." I then asked him if he had ever been to visit Mr. Gurler's place. He said he had not—that milk was recommended. In a little while he said: "I promised to recommend this milk until the first of April, but I will recommend the "Crabtree" milk after the first of April." I said: "I don't want your recommendation; you have never taken any tests or seen my place. What I ask you is to come out and see; not to recommend it." I was selling 160 quarts in his neighborhood and we went down to 43 in a week. I have been up against it every time. At Winnetka we are selling from 150 to 200 quarts of milk per day and that dropped suddenly. I found it was due to a prominent physician who was a personal friend of one of my competitors whose milk was not as good as mine—his bacteria was higher than mine. These things are what hurt and what we have got to look into and watch.

In regard to this certified milk business. From the start I have made up my mind that I would make a study of this matter and I have from the Atlantic to the Pacific. A year ago last June I was in the East and went into every certified plant in the neighborhood of New York, Boston, Philadelphia, etc. I went to the most prominent plant, one of the leading milk producing plants, went through, in the stables, I saw the cows and the methods used. I went into the dairy—I had had experience

enough to know then whether it was well or badly done; I saw the milkers, the condition of their hands; I saw everything about it, and they were selling certified milk, getting 15c to 20c a quart. Upstairs where the milk was being received and as the cans came in they were put in hot water and there was a man there with an ordinary woolen suit stirring them around and once in a while the milk would be splashed. I said: "What are you doing here?" He said: "We are bringing that milk up to a temperature because we had two milkers peeling with scarlet fever." I said: "Do you mean to say that in a certified dairy where you handle the milk from about two hundred cows that you permit men who are peeling with scarlet fever to milk these cows?" I asked if they allowed these foreigners—and they have the roughest sort of foreigners,—to work without examining them to see if anything was wrong with them. Yet this milk was going out into this little town near New York and sold for 15c a quart and they had two milkers there that were peeling with scarlet fever.

Now, another thing in regard to this bacteria reading. I find it most unreliable—I find it oftentimes, from the Atlantic to the Pacific, up into Pasadena, all up the coast, there is a wonderful way of reading bacteria. These readings are oftentimes made to suit the buyer. Take for example a certified dairy here in Chicago. When I started in my bacteria ran 5,000 to 10,000, sometimes 15,000, sometimes 700; generally about 4,000 to 5,000. These tests were made by Professor Hastings of the University of Wisconsin. There were no made samples; I put them up myself and sent them myself to Professor Hastings. I found pretty soon that it was very hard to get milk into a certain district in Chicago because Mrs. Durand's bacteria was 5,000 and that they had had an average of 200 for twelve months previous, taken every two weeks. It was not because I was smart, but I looked into it—I learned how they did it. It was not honest. The same thing is done by one of the largest dairies shipping into the City of New York, taking a bacteria test twelve months, taken every two weeks. The proprietor did not know

who I was and showed me time and again no culture. I learned how it was made; it was not honest. I went to the Pacific Coast and I went to a certified dairy out there and there was a very fine dust that blows, as you know, a black dust and there is also this mud that sticks to these cows. The man had milked two cows and the cloth (he did not change it) after that was absolutely black. And yet the manager claims the bacteria tests running for twelve months showed an average of 300. The customers were being fooled. The babies were taking that milk. My experience this last spring when my milk was being tested by Professor Hastings at Madison, showed that we were running very fair milk, sometimes 15,000. A man sent out from the City Hall happened to be there. He looked around and then wanted a sample of milk. I said, "Certainly." He walked in and took a sample out of a bottle. "Don't you want some ice?" I said. He said, "No; this is all right." He left and went to the station. I walked right in and took a bottle of milk next to the bottle he took the sample from and sent it to Professor Hastings—2,700 bacteria, and I think the Wisconsin University is perfectly honest in their tests. From the City Hall came the report 500,000 that this man had had. I went in to see him and I had never been into the laboratory before and when I was there I saw a jug of "Crabtree" milk that they had picked up in the street from one of my wagons. I glanced around and saw everything, and I said: "I have come to see you about my bacteria reading. However, it is not necessary to see you, I should think from the condition of this laboratory that my milk would have been five billion instead of 500,000," and I walked out.

I believe, gentlemen, that the only solution of a pure milk for the babies is not by certified milk protected by any commission, but is with a small herd that you and I can produce clean milk that can be sold in the City of Chicago for 10c, that can be fed to any delicate child. Take a small herd of 25 to 30 cows, where the owner himself is vitally interested, is at the helm, and with two men can milk those few cows and clean milk can be produced. That is the only solution because I have gone across

this broad country of ours from one coast to the other, from East to West, from North to South, and I would not give that much for your gentleman farming.

We now reach the point of this question of milk for Chicago. I take it for granted that these gentlemen in front of me are all producers of milk to the Chicago market. We are passing through a serious time, gentlemen; we are being made a foot ball of, in other words. Now it is a question of pasteurization or tuberculin testing cows. I believe that Dr. Evans has missed the key-note of the whole thing. I don't think we have to consider either one or the other. I don't think it is such an impossible task to go out among the 12,000 dairymen producing milk for the City of Chicago and ask for windows in the stables, for air for cows, sunshine, as much concrete walls as you can, warm water, have some steam. Find a way of keeping the cows clean—that is the greatest question—"Find a method of keeping the cows clean!" I think Governor Hoard's method is the best, that is of using a 2x4 making a ridge right in front of the hind feet of the cow so that when she wants to lie down she is obliged to pull her feet over the ridge, move the body up a little and thereby keep clear of the gutter. It is impossible for the farmer to keep his cows clean and you can't expect him to take the time required to clean those cows in the condition he finds them in the morning. Again, urge the farmers to keep their cows out as much as possible on warm days and to see that the cow is properly cared for, that utensils are sterilized, that the milk is immediately cooled. Now, gentlemen, I don't believe the question of pure milk is ever going to be solved by Dr. Evans or any Board of Health, nor by the State Board of Health, nor by the physicians, in fact not by anybody except ourselves, and I believe that we have too much respect for ourselves to have anybody try to solve this thing for us except ourselves.

Are we going to be lashed and whipped and called all kinds of ugly names, and say we are killing the babies by the thousands in the City of Chicago? Let us handle that pasteurization business. They don't need pasteurization; when the milk is clean

it is needless and when the milk is dirty it does not take the dirt out of it. What is it for? It destroys all the harmless germs and leaves more room for the more dangerous ones which it does not kill.

Pasteurized milk, when sweet to the taste, may be poisonous. It is a bad thing all around, except to the man who is interested in selling pasteurizers—there is the keynote of the whole thing. I want to read to you one thing about this pasteurized milk which Dr. Evans has been urging, it is from an article in Pearson's December issue, written by Arno Dosch, entitled, "The Pasteurized Milk Fraud":

" * * * * If you use the dirty raw milk commonly sold in cities, you take some chance with half a dozen disease germs, but the one you are a hundred times more likely to encounter than any other is that of tuberculosis. The others appear only sporadically and locally. Tuberculosis is there all the time, everywhere, but in raw milk the danger is minimized because it is hampered in its growth.

" * * * * The first man to raise his voice against fraudulent pasteurization was Dr. George W. Goler, Health Officer of Rochester, New York. Dr. Goler is a pioneer in the fight for pure milk. With an unusual appropriation of only \$6,500, in ten years, he has purified Rochester's milk supply, without resorting to pasteurization.

" 'Pasturized milk,' he has said, referring to the commercial process, 'while having a low bacterial count, owes it to the death of countless millions of the more harmless micro-organisms, while leaving more dangerous organisms to multiply.' " * * * *

So much for pasteurized milk. There is no necessity for it and it is an insult to the dairymen when they say they have got to pasteurize our milk.

Now, I want to get down to this tuberculin test business, and I am going to speak my mind in regard to it.

I went up to Madison and took a farmer's course two years; kept in touch with Madison and other Agricultural Colleges. I have read Hoard's Dairyman ever since I owned a cow and know Governor Hoard. I accepted it, I preached it—the tuberculin test. Only a year ago, down at Edwardsville at the State Farmers' Institute, you will see that Mrs. Durand was very strenuous in what she stated about the tuberculin test, and what I thought ought to be done in Illinois; but, gentlemen, I have changed my mind, and it was through the blundering of men who wanted to harm me that has made me change my mind, and I think I am going to be of some real benefit in the world after all.

I have had my cows tested every year for tuberculosis; sometimes I have had one or two re-acters, generally from cows I had just bought who had never been tested, although they said they had. For the last three years I have had one veterinary surgeon who has tested my cows with me every April. I have the greatest respect for that man in every way. I have been with him on other farms and I know that he is absolutely beyond reproach; moreover, he has made the tuberculin test a study. He has scrap books which contain everything that has ever been written in tuberculin testing.

We tested our cows in April; we had three re-acters of cows that I had bought within the year; they were disposed of. We sent our tuberculin test to the City Hall. I have never had a tuberculin test made of my herd that I have not myself read 90 per cent. of the temperatures and I believe that I have as much intelligence as the ordinary veterinary surgeon, and I believe that I am honest.

I wanted to do the right thing; always have wanted to do the right thing. I read 90 per cent. of the temperatures taken last April, taken on my herd; I know that the thermometers were good and saw them properly recorded by the young man at my side. We took some the day before and the day after; they went to the City Hall and were accepted and I saw them put

the tests in the drawer or shelf. Now I have a farmer there near my place that I bought some milk of, and, according to my verbal contract with this farmer the same veterinary surgeon should make the test or I would not buy the milk. He could not test the herd that week, could not for two weeks, and when he got there he told me the herd had already been tested. He said the other man wanted to do it and I let him do it. I said: "The other man is only a horse doctor and he does not know a cow from a nanny goat." He said: "What did he do?" He said that he came in the morning and took temperature and went home, came back at noon and went home, came back at night and an hour after the last temperature he inserted the tuberculin. I took pains to have two witnesses when I asked that question; I didn't say anything to the farmer. I made an errand to his home the next day so that I could see his sister before a witness and she said he came and went and the next morning when the farmer came with his milk, that was on the 25th of April, I told him that after the first of May I would refuse to take his milk, contract or no contract. The first of May came and he brought the milk and left it. I had a team hitched up and I took it back and put it on his side of the fence and he brought it back and I took it back again, and by noon it was butter, good Elgin butter. The third day he realized that I was a woman and there was no use coping against a woman, so he did not bring it again; he got busy.

A day or two later he wanted to know what was the matter with that tuberculin testing and wanted to know if I was going to take that test, that he had been to our State Veterinary Surgeon and had the records of that test every two hours. I told him that Cook had his records for the North Pole, "Good-day," and rang off.

In a very short time it seems that somebody got busy and went into the City Hall and threw out every tuberculin test made by this veterinary surgeon of mine; honest tests made with honest fresh tuberculin; temperatures taken all right; everything was all right. Now, this old veterinary surgeon felt terribly humili-

ated. He did not tell me the City Hall in Chicago had thrown out my tests; he knew it.—about the first of June or in May, and yet I sent certified milk into Chicago and it sold at 15c per quart. Why did they not notify me? Then I had a fire and a sale, but before I had this sale in the summer I received notice—by the way I had not been certified since the first of May by the Chicago Milk Commission. I held off just as long as I could; my agent went back on me and got milk that another agent was handling, that made the other agent mad and he came to me and wanted to know if I would not get the milk certified. In the middle of the summer I received notice that they had decided to have the government men at the Stock Yards test the certified herds and wanted them tested right away.

My herd had been tested in April and I did not want them tested again until fall, until October or November, after they had been brought into the stables to stay. I don't consider that October test, so at my sale I made the statement that my cows had been tuberculin tested in April—I did not know that these had been thrown out. The Board of Health had not notified me. So I sold some cows that went up into Salem, Wisconsin. A week after they got up there I received a letter from this man to whom I had sold them saying that he was having a terrible time, the State Veterinary of Wisconsin would not O. K. the test. Then I went to the City Hall and found that the tests had been sent away. Then I found out what had happened. Those tests were honest tests and I sent in the original tests which I had gotten from this veterinary surgeon to Wisconsin and I then received a letter stating that they would not accept them; then I wrote them a very sassy letter. I wish I had a copy of it here to read to you, and I got this in reply yesterday from the State Veterinary Surgeon of Wisconsin:

“In looking over the temperature records reported by Doctor ———, which he sent to Mr. ———, will say that in this case, even though the Veterinary Surgeon of Illinois would approve of them, these temperatures seem to be impossible, and therefore would not accept Doctor ———’s test under any consideration.”

That is a reflection upon me because I saw those temperatures taken myself. And this man don't want those cows there and I don't want them here, so what are you going to do?

It was agreed that upon a certain day the government men from Chicago would test my herd of sixty-five cows. On the appointed day I heard a car stopped and looked out and saw a REGIMENT, seven men. I went out to meet them and I said: "Gentlemen, you have made a mistake." They said: "Why, is not this the day and is not this Mrs. Durand?" "Yes," I said, but we have sixty-five cows and you should have one man to each cow; you have not enough men." And they said: "Two more are coming tonight." That made nine men. I said: "You should have one man for every cow, and as we have sixty-five cows to test today you should have brought sixty-five men." They went into the stables and took the temperatures during the day. I did not pay much attention to them until it came to one cow and we had a little controversy over one cow and I won out on that. I wasted 50 cents telephoning that night to notify the "other two" not to come, though it would be cheaper than boarding them, but they came anyway. I said: "When are you going to inject the tuberculin, because I want to see the amount put in my cows, and I want to know all about it." I want to tell you that I love my cows, and I am going to be there. I was obliged to go away and they said they would make the test at nine o'clock that night. I returned at a quarter of nine and the whole thing was done. The tuberculin had been injected, and they wanted to know if the electric light would burn all night. I said, what do you want of light all night for, and they said, "We are going to take the temperatures every hour and a half after injecting the tuberculin." I said: "Not on my cows," and I asked them where they got the authority to come out here and test my cows all day and all night. They said they had authority from the government. Perhaps some of you noticed the headlines that appeared shortly after that: "MRS. SCOTT DURAND IS GOING TO THRASH THE GOVERNMENT." But I asked them: "Where did you get your idea about testing in that manner?" They said that

Doctor somebody of Canada had written a paper in which he said that the case might be at sometime or other it might happen, about as definite as that, that a cow will have a perfect arc during the night and be perfectly normal during the day when you take the temperature. "Did you ever hear, see, or know of a case?" I asked. They did not know; there might have been a case somewhere, sometime. I told them I would put \$1,000 into the bank at Lake Forest to their credit if they could show me a cow that would have a perfect arc during the night and not re-act during the day, and they could give it to any charity they wished. I told them that I had been taught at the college the proper way to make the test and that I considered this test irregular; that they had no right to experiment on a certified herd, and that to get them up during the night I would have a shortage of milk which I could not afford to do on account of the babies that needed it. I asked them why they did not experiment on some other herd, but I will tell you here that I did not let them have any electric light, they had to use lanterns; and I did not give them anything to eat at twelve o'clock, but they did help themselves to my milk. They took the temperatures and the next day when I came out in the afternoon they told me that ten of my best cows were re-acters, a Holstein that had made 17,000 pounds the previous year and a three-year-old Holstein just freshened with calf which was giving 65 to 70 pounds a day. We have not got enough of those cows to have them go like that. Those cows were in good shape, ate their feed, were sleek, fine and healthy. After they had left I went down to the alfalfa field and I sat down and I did not cry; I howled. I had not cried so hard since I was five years old. Then I came in and tried to eat some soup, it stuck in my throat and I could not eat. They tried to get me to eat, but I said: "You might just as well leave me alone; don't you try and feed me; I am going away." I had on a very thin waist and a white woolen skirt, I remember, and I started to run and ran hard until I got down to the pasture with the beautiful maples and under these trees were my sixty-five cows. They saw me and came up to the fence and I

cried some more, and then stood there and gazed on the beautiful scenery. We have a beautiful farm overlooking Lake Michigan. I finally found a ravine where I could work this off to my satisfaction and I sat there with the beautiful serene scenery about me and the ravine with the water flowing down, and I felt the whole thing slip away from me; I felt that it was all over, the game was up, that after working as hard as I had to have things clean, to have plenty of air, good ventilation and sunshine and have the thing right, to have such a blow struck at my cows, and I began to think about it all and suddenly an inspiration came to me and I got up and stood up. It was moonlight and I looked at my watch; it was 1:30 in the morning, and the thought came to me and I really was happy. I thought to myself: "Why all this fighting and fussing about this tuberculin testing; it is not the tubercle bacilli that is the trouble, I have discovered another germ, the most viperous, dangerous, poisonous germ there is today in the world, gentlemen, a germ that if the Illinois State Dairymen's Association can kill, it will be of the greatest benefit to the world at large, and that is the "HOMO-GRAFTI" germ. Now, I have coined that word and I hope it will be used, because I tell you, gentlemen, it lurks everywhere, and the more I thought about it, why—the thing came as plain as could be. The homo-grafti, its alfalfa is the greenback; the corn is the gold coin, when it is satisfied your milk is sweet, your stables clean, your ventilation is good, everything is all right. But when it is hungry, gentlemen, it sours your milk, the stables are dirty, your bacteria is 500,000—the way mine was.

Now gentlemen, Dairymen of Illinois, don't let's have any more trouble with this pure milk question for the City of Chicago, because it is a fine thing politically, especially if you want to be elected Commissioner of Health, to have these sensational articles on the first page of the Tribune, make out we are killing all the babies, that the milk is full of bacteria. What do I care about the article that came out in the Tribune about Washington. Those things are not worth that much in my estimation; they don't know anything about what they are talking about.

When you come down to this tuberculin testing, we cannot afford to have tuberculin testing unless we kill that homo-grafti first, and it is unquestionable in my mind whether it is advisable to have the tuberculin test or not. I took the pains today to telephone to Mr. Charles Hill of Rosedale, Wisconsin. He has gone over to the Island of Guernsey every year for a number of years. I said: "Mr. Hill, did they ever do anything about the tuberculin testing in the Island of Guernsey?" He said: "Not until three years ago when they took a herd to England and got the disease; now they are testing." I asked: "Do you know whether they tested those cows before they went to England or not?" He told me that he thought they did, but was not sure. So up to three years ago, herds of 150 years of cows that were never tested with tuberculin test, and the cows were strong, vigorous cows, splendid type that we are all trying to buy now. They went into England and they came back with tuberculosis and they have been having and have to have the test now for the past three years and are beginning to find tuberculosis. But of the thousand heads of Guernsey cows sent into America only 20 ever re-acted at our port here in America. This is something to look into, all those years that those cows did not have tuberculosis, but whether a man believes in the tuberculin test or not, you have got to be mighty careful where the tuberculin comes from and they tell us that the government cannot furnish one-half of what is required—now what are you going to do about it? Whatever you do, don't permit that compulsory tuberculin test bill that they are trying to have passed in Illinois.

Times are not bad; we seem to be helpless with Chicago on the tuberculin test or pasteurization, but I think if we could have meetings of the Illinois State Dairymen's Association and rally together, and if we could raise a fund, say each dairyman put in \$2.00, I would be willing to contribute \$100.00, that would make about \$25,000.00 a year, then we could afford to hire officials of our own standing where the homo-grafti can't get in and get out, and help our brothers in the business. If a man wants and must have help, help him; where they have boarders,

get rid of them and help him in every way to have his stables clean.

When I had the committee come out to score my dairy for certification, I found that I had nothing counted on ventilation because I had too much; I was scored way off because I had too much ventilation. Two sets of men came out there. The first three sent me their report and the next three sent in an entirely different report. I sent both reports to Professor Hastings and asked him which to follow, because I could not follow them both.

I have spoken very plainly but have told you the facts, and there is nothing that I have stated that I cannot absolutely prove.

I missed it, gentlemen; I want to say that when I sent my cows which had been re-acters in to the stock yards, I had a special butcher and not one of those cows had tuberculosis. Badly as I felt about that, I am glad today because I believe that those cows were sacrificed for the good of every member of the Illinois Dairymen's Association.



Mr. S. B. Shilling, Chicago.

Mr. Chairman, Ladies and Gentlemen: I am not going to make a speech. I am out here to talk to you providing you did not have anyone else, notwithstanding the fact that I know it is quite common for Chicago men to come to Elgin and make speeches, I am not going to take advantage of the occasion that is offered me.

I want to congratulate you upon having the opportunity to listen to the address you have just listened to, and while I do not subscribe to everything that Mrs. Durand has said, I believe in the main she is correct in her statements.

I asked the Chairman when I came in here what he wanted me to talk about, and he said tell them a story.

Now, while I often indulge in that, I do not feel like taking up your time that way this evening. You down there in the audience can hardly appreciate how embarrassing and difficult it is to stand here before you. As I said before, I am not going to take up your time in a speech. If I do talk to you it will be on other lines than dairying. You have had enough of that this evening.

For just a few minutes I will touch upon other subjects which are of just as much importance and which are facing us today for a solution. These subjects might lead into the dairy question but I am not going to follow them far enough.

The first question I wish to talk about is one that leads into the dairy subject, and that is, its relation to the conservation of the soil in this country.

I am standing, I believe, in the dairy center of the Universe. It is somewhat different with me from what the lady said when she looked this audience over; she said you were milk producers. As I look you over I am suspicious of almost all of you; I rather size you up as sidewalk farmers, that is seven-eighths of you. If you are producing any milk you are doing it by proxy.

But I am going to tell you a story.

There was a child that was receiving a visit from its Grandmother; the day after the Grandmother came she had the child in her lap, the child said: "You are my Grandmother." "Yes," she said, "I am your Grandmother on your father's side." The child hesitated a little and then she said: "If you stay around here long you will find you are on the wrong side." And that is what I think most of my hearers are, they are not dairymen at all and there are subjects that interests them more than the dairy question, and what brings this to my mind is the fact that I have just read a statement that has just been issued which gives the condition in New York, and before I sit down I am going to read you a little.

I feel it is presumptuous for me to stand before you and undertake to instruct you. I could not do it if I should try and, while I was introduced as a farmer, and am in a way a sort of a farmer, no better nor no worse than many who are in this audience tonight. There is this feature about dairying that I understand, that when I am receiving my returns from the dairy cow, I am getting only a small proportion of what that cow is really giving me. I do not believe we appreciate the profit she is giving us, outside of her milk product, that is in restoring the fertility of our farms.

What brings this to my mind at this time are these statistics which I propose to read to you. I know I do not have to emphasize the fact that at one time New York was equally as fertile as this country, but the system they have practiced in their farming methods, by which the land has been cropped continually for many years, it is almost entirely unproductive. The value of it has gone down from a hundred dollars to forty or forty-five or even less an acre.

I believe a young man who is intelligent and wants to engage in the farming business today can do better by going East than he can by going West for a farm. These statistics I am going to read are recent and I do not know of anything that would be more interesting than to give them to you:

LOW PRICED LANDS IN EAST.—Of the 936 New York farms listed for sale by the Bureau of Statistics of that state, 429 farms, representing 61,523 acres or nearly one-half the number listed, are for sale for \$30 or less per acre. Of these 429 farms, 182 representing 23,231 acres are listed at prices ranging from \$20 to \$30 an acre; 193 representing 28,914 acres are listed at prices ranging from \$10 to \$20 an acre; 38 representing 6,973 acres, are listed at prices ranging from \$5 to \$10 an acre, and 16 representing 2,405 acres are listed at \$5 an acre or less.

It is a strange thing to me, and I know it is to everyone if they would stop to think. If we would just think, is it possible for us upon our farm lands to keep continually taking away year after year and putting nothing back and have that land respond. It is a simple question. It is contrary to all sense of reasoning. No one realizes it better than you do.

It seems to me when I stand before you and talk about the value of the dairy cow you understand it fully as well as I do.

There is another question and that is a question which confronts us and which must sooner or later demand solution. While I have no desire to find fault with the government, I do believe I am justified in saying, that when the government gives \$399,000,000 to the sustenance of our Army and Navy and only \$13,468,000 to the support of agriculture, every man is justified in standing before an audience and finding fault with the way the Government treats the greatest industry this country possesses.

As I have to talk to you tomorrow, I will not take any more of your time at this time. There are subjects I would like to talk about tonight but as I said before I do not intend to talk dairying tonight. There are many issues that should be discussed and tomorrow I will have the opportunity of standing before you and discussing some of them, those that pertain to dairying.

I have only touched upon the two questions which I believe to be of the greater importance to us today, the value of a dairy cow for maintaining the fertility of the soil and the other is the unfair way the agricultural interests are treated by our Government. Gentlemen, I appreciate the applause for the reason I believe you appreciate the justice of our case. You must appreciate the fact that the agricultural interests of this country is the foundation of our wealth, it is that that makes us strong. If we had one-fourth of the money that is expended for the Army and Navy for the promotion of our agricultural interests of this country, it would make us so powerful we need not be afraid of the combined armies of the world. If I have an opportunity tomorrow I will talk to you further along this line.



Tuesday Morning, January 17, 1911.

Opening of Convention.

President: I will ask you to rise while we ask the Rev. Clark S. Thomas to invoke the Divine blessing, at the opening of the Thirty-seventh Annual Convention of Illinois State Dairyman's Association.

Dr. Thomas: Our Great Creator and Kind Father! This morning we pause in the midst of our busy commercial lives to ask divine blessing to rest upon all the interests gathered in this Convention.

We thank Thee for our great resources and for our prosperity. We return to Thee our thanks for all that has come to us during the past year. Be Thou with us during this Convention, be Thou with us in the future and we will give Thee praise and glory, for it is Thine, in the Master's name. Amen.

President: We are honored in having with us Mr. Fehrman, the Mayor of Elgin, who will make a few remarks and welcome you to the City of Elgin.

Mr. Fehrman: Mr. President, Members of the Association, Ladies and Gentlemen: Since my incumbency of the office of Mayor, it has been my pleasure to welcome members of almost every kind of society and representatives of most of the trades. I have tried to the best of my ability to impress upon all of these people the fact that Elgin has been and is an hospitable city, that the latch string is always upon the outside of the door and that something of good cheer awaits within the portals.

I believe that all who have visited here have found this to be true, and I am sure that your stop here will prove no exception to the rule, and in behalf of our city I extend to you a most cordial welcome.

Of all industries Elgin is most interested in milk products. For many years Elgin has fixed, through its Board of Trade, the price of butter everywhere. At times Chicago has sought to control it, but without success, and the general belief is that the producer, not the broker, should fix the price.

The beautiful river and the fertile valley that surround Elgin make it the greatest milk producer, and therefore ought to be the center of this great industry. I believe we could spare any other line of business with less loss to all our people.

We are proud to have you with us and trust that your tempers will be as sweet as the cream you produce and the butter you make, and that much good will result from your meeting.

Remember that Elgin has been made famous to the farthest corners of the earth, by butter, condensed milk and straight milk.

May this condition continue.

Again I welcome you most heartily and may success attend you one and all.

President: By a mistake on the part of the printer, Mr. Sudendorf's name appears on the program. The name of Mr. Chas. Gilkerson of Marengo should have appeared, and I take pleasure in introducing Mr. Gilkerson.

Mr. Gilkerson: Ladies and Gentlemen, Members: I remember when I was a boy I spoke a piece which began something like this: "You'd scarce expect a boy like me to get up here and speak a piece as well as those who wear a larger kind of clothes." And that is somewhat my feeling today. I really feel a little out of place on a program with the men of world wide reputation we have with us.

In responding to this very pleasing address of welcome I am reminded of a conversation two preachers once had. One preacher wrote his sermons and read them and the other preached extemporaneously. They were talking about the various degrees of success preachers had and the one who read his sermons asked the other why he did not have as good success as he who did not

read his sermons, whereupon the other replied: "Well, I'll tell you exactly why; after you have written your sermon the devil comes along and looks it over and knows just exactly what you are going to say; but when I get up to preach, the devil himself doesn't know what I am going to say."

We came here on your invitation today because we thought you meant it, and we take you at your word.

We really already feel at home in your midst and gather from the elaborate preparations that have been made for our comfort and pleasure that we are indeed welcome.

All men are more or less of evolutionists. Darwin advanced the theory and we have all proceeded to accept it. Some men claim they evolved from the monkey, and we believe them. Others evolved from a hog, and we believe them. But we claim not to have evolved from a cow, and its up to us to substantiate this. Watch us. We began in this world by being dairy men and we continue our occupation. No evolution in that. Some of us, though, are like the fellow who was pulling and hauling at an old cow that he was trying to get home. Being tired out in the process, he sat down by the roadside to rest and a man came along the road and accosted him, asking him what was the difficulty. He told him, whereupon the newcomer pulled out of his satchel a box of something and rubbed a little along the cow's spine. Immediately the cow picked up her ears and with head erect and tail extended she disappeared down the road. Whereupon the man who owned the cow, said: "Have you any more of that stuff?" The man answered "Yes." "How much is it?" asked the man. "Twenty-five cents," replied the other. Handing him a quarter, the dairyman said: "I will take a box, and, sir, if you will just apply a little of that to my spine I would like to catch that cow."

We are all trying to catch the fellow who gets ahead. We claim we are the greatest benefactors to mankind. We supply to the world the most healthful, most nutritious and the cheapest article of food in the world. There is nothing combined in one article that is more a perfect food than whole milk.

I have known cases where the consumption of new milk and work on a dairy farm combined has cured severe cases of lung trouble that today would be called tuberculosis.

You know the old Jews sought a land flowing with milk and honey. We bring you authorities on all of the subjects presented in our program. Our aim is always "the best is none too good." We bring you the strongest program that has ever been presented at a dairymen's convention.

We come here to give as well as to get. "He stays who lives to sell. He lives who lives for others."

We are glad to have you young people in our audience for the old are too fixel in their ways to change and any new ideas presented to them are not readily accepted or practiced; but the young man and the boy are ready to absorb and put in practice the modern methods they see and hear. They must be influenced early in life or not at all. Some one has said, "One ship sails east and sails west with the very same winds that blow. It is not the gale, but the set of the sail which tells them which way to go."

We bring you demonstration and research and the result of long years of study on the subject of tuberculosis, not that we expect to settle the whole matter, but we do expect to learn some things in regard to this great subject which is occupying the minds of great men today, and is of vital interest to the dairyman. We bring you the best authority on making clean milk; (the world has no place for a dirty dairymen) and also how to make the large quantity and make it in the cheapest manner.

We claim that we should keep more cows and better ones on the same amount of land. We ought to put our ideals at least a cow to an acre and three hundred and fifty pounds of butter fat to the cow. We also believe that while we know that one-third of the cows of Illinois are kept at an actual loss to the owner and one-third return no profit, but simply pay their board, and the other third are the only ones who return a profit to their owner, that our attainment should be "profit in every cow." And our ideals should be "a can of milk to a cow."

When we reach this ideal then let us pitch our ideal higher. The old motto is a good one: "Hitch your wagon to a star."

We are not idealists; we are the most practical men on the face of the earth. We earn our bread by the sweat of our faces instead of our brow, and "Whatsoever our hands find to do we do with our might." We believe in every sense of the word in the milk of human kindness and an ideal dairyman comes the nearest to being a true Christian of any business man. He must be kind, loving, gentle, have faith, hope and charity. He must be a gentleman and a home lover. So do not be afraid when you give us the keys of your city. We realize as many others do not, that a quart of milk is worth a keg of beer and that there is as much nourishment in a quart of milk as in a pound of beef-steak; but don't feed us altogether on milk while we are here, for we can get that at home.

We are very glad to be here in Elgin—the home of the Elgin board, the home of the Elgin watch, the home of D. C. Cook, and the home of our esteemed friend, Honorable J. B. Newman, where we are sure pure food will be served.

We are glad to be here because we are glad to be here, and because we believe you are glad we are glad to be here.

So again let me say that we thank you for your most cordial welcome and I assure you we appreciate your kind words and prize your friendship among our most precious jewels.

President: I don't see much use in reading my little paper after Charlie Gilkerson gets through. He always takes all of the thunder, but Mr. Caven seems to think we always must have a President's address.

I have a few things that I have jotted down that I would like to try and impress upon this audience.

President's Address.

L. N. Wiggins, Springfield.

When one thinks of what the word Elgin means to the dairy world, it was highly fitting that the directors of this association accept the invitation from the people of Elgin, and vote to hold the Thirty-seventh Annual Convention in their city.

There are so many phases of the dairy industry that it is impossible at our annual convention to discuss every subject. Your "Program Committee" has been very fortunate in securing speakers of national prominence, men who are posted on both the practical and scientific sides of the subjects they will discuss.

We have reached a very critical stage in the dairy business in Illinois. The values of land in all parts of the state have increased so rapidly that every owner and every renter of land must make extraordinary efforts to earn satisfactory profit for the amount of money invested. It seems to me that some of the owners of land have been getting a little bit the best of the investment, on account of the fertility of the soil being increased by maintaining dairy cows on their land. The dairy farmer must convince himself of the importance of milking, breeding and raising only the best of dairy stock.

He does not use in the cultivation of this high priced land old antiquated tools, and thousands upon thousands of dollars are invested every year in modern machinery. He cannot expect to use the old type of low grade dairy cow, as the principal investment of equipment in his business, and expect to get modern results. Some of you are probably tired of hearing me discuss this point, but I feel that the successful future of the dairy industry in Illinois depends so much upon the quality and breeding of the cow, that this topic cannot be forcibly enough brought out.

We have been accustomed to expect that dairymen in other states are going to allow us to buy their profitable dairy cows and

they retain the poor ones. The fallacy of this reasoning is self-evident, and unless our dairy farmers see the wisdom of buying pure bred and registered sires from known milk producing families, and use these sires upon their best grade cows, saving the heifer calves, and in this way gradually bringing up the standard of the dairy cows of this state, we will soon become a back number in the production of milk. Then from the point of cash values the high grade cow is worth more to sell than the low grade.

Ash the dairymen who have been wise enough to buy pure bred sires and grade up their herds what they think of such a scheme, and if it pays financially; their answer will always be Yes! A great many modern dairy farmers have realized the importance of testing their herds with the Babcock Test for butter fat, weighing the milk from each cow, and keeping a record of her production. Ask any one of these men if such a course has made them money, and see what their answer will be. Always and emphatically—YES! It is sometimes hard to convince the dairy farmer that he should own a Babcock Tester, and test his own cows for butter fat; therefore, we have been striving to organize associations among the dairy farmers for cow testing. The object of these associations has been to try to band enough dairy farmers together to minimize the expense by having one man employed by the year to test all herds in the associations. Of course the individual farmer can do his own testing very cheaply, if he is wide enough awake to do so, and a technical education is not required to successfully operate a Babcock Testing apparatus.

But while we have been raising or buying cows there has crept into our herds the white plague, "Tuberculosis," which annually exacts a tremendous toll of lives of dairy cattle. I do not know how many succumb to this disease during the year, but I know it must be enormous. I hope some day we will have statistics that will show us what this death rate is among dairy animals. You will all agree with me that the health of the dairy cow must be normal before she will yield us a normal profit, but if she is affected with tuberculosis, sooner or later she will become so emaciated and in such a poor condition that she will have

to be sold or disposed of at a loss, and the dairyman has another account on the debit side of his books.

I am perfectly satisfied that in the first stages tuberculosis will not affect the normal yield of milk from the dairy cow, but an affected cow is always a menace to the other stock upon the farm. What are we going to do about the eradication of this disease? It is time that each man decide in his own mind what he wants to do about it. The value of the dairy cow has materially increased in the last few years, and the health of the individual cow must be protected for the benefit of the entire herd, which in many cases represents a very large investment.

We can leave to scientists the question of whether or not bovine tuberculosis is transmittable to the human, but as sensible men we must protect the general health of our cows, as they represent our main investment.

At the last session of the legislature a commission was appointed to make investigation of the conditions of dairy cattle in this state in regard to tuberculosis, also to suggest means for the most efficient method of its control and eradication. Their report has not been made public, but I would suggest that any cattle admitted to this state, for breeding purposes, be accompanied by a certificate endorsed by the proper authorities, declaring said cattle to be free from tuberculosis, accepting as our best known agent for the detection of this disease—the Tuberculin Test. The Tuberculin used should be obtained from government laboratories. The State Live Stock Commission should have full control of all live stock matters, and should be allowed, by the Legislature, sufficient funds to enable it to put enough competent men in the field to assist the dairy farmer in the eradication of tuberculosis, and many other diseases which might affect his herds.

For several years the directors of this association have authorized the holding of one-day dairy meetings at numerous points throughout the state, and practical and well posted men have been sent, upon request, to any community to speak upon dairy subjects. We feel that these "one-day" meetings have

brought to the farmer's door information regarding dairy subjects which has been of untold benefit to the farmer and community. This association has stood the expense of these meetings, and just as long as there remains any money in the treasurer's hands, I would advise a hearty response to calls from any community which wants to gain information, and build up the dairy business.

In the locality of Elgin where so much milk is shipped to Chicago for direct consumption, the dairy farmer is especially fortunate, but I am afraid there are many who do not realize the importance of co-operation with the milk distributing firms, in the production of sanitary milk. The consumer is willing to pay a good price for clean milk, but he objects to paying a good price for dirty milk. The expense of producing clean or sanitary milk is no more than the expense of producing dirty milk.

The dairy farmer who markets his products from the dairy herd in the form of cream, which is to be made into butter for human consumption, must awake to the vital importance of getting the cream to the butter factory in the best condition possible. The butter consuming public is not willing to pay a high price for butter that is not good, and consequently will buy oleomargarine or some other substitute. The main loss eventually falls upon the dairy farmers.

For the economical production of milk, aside from the character of the cow, the general health, the sanitary condition of the stable, the question of feeds is of great importance, and requires a great amount of systematic study. A large amount of money is wasted on the dairy farms every year through negligence on the part of the feeder, making a study of the proper quantities and kinds of feed which are fed to dairy cows. This item alone shows a large profit or a great loss to the dairy farmer.

We have been successful for the past few years in having appointed as "Assistant Pure Food and Dairy Commissioner," men who have had training in dairy lines, and a great amount of good work has been done to assist the dairy interests, and our

commissioners should be protected by a law that would enable them to enforce the proper manufacture and sale of feedstuffs.

The successful operation of all branches of the dairy business depends on the hearty co-operation of one with another. This association has always stood free from politics and party lines, and has aimed to assist in the advancement of better conditions on the dairy farms, better dairy cows and better dairy products, and I sincerely hope that this meeting, in the heart of the dairy district of this state, will have the effect of promoting a better understanding and more hearty co-operation than ever before, with the aims of this association.

Committees Appointed.

President: There are one or two important committees I would like to appoint right now.

I would like to have the following gentlemen serve on the membership committee, if they will:

Charles Gilkerson, Balch Newman, E. Sudendorf, Theo. Getzleman, A. F. Jansen, M. S. Campbell.

This membership committee will please see Mr. Caven and secure receipt blanks, and let us have every man in the hall, if possible, join the association; a dollar helps carry on the expenses of the organization and it does not mean much to the man who has to put it out.

On the resolution committee I would like to appoint Judge John Lynch, E. W. Wing, O. V. Fox.

The resolution committee will please try and get together after this meeting is over and outline their plan.

The membership committee need not wait until after this meeting is over.

Professor Fraser is unable to be here this morning and I have asked Judge Lynch of Olney if he will not say a few words and tell us what they are trying to do in the southern part of the state.

Judge John Lynch.

Judge John Lynch: The President has been so in the habit of inviting the speakers to speak before he calls on them, he thought he had done so with me, but he has not. I might repeat what your President has said and what Mr. Gilkerson has said, that on behalf of the association personally I am glad to be in Elgin at a meeting of this kind.

I have for a few years been giving some attention to developing dairy interests in southeastern Illinois where I live, and I have always had a great admiration for Kane county or Elgin, the seat of the great milk and butter producing interests of America.

We down in southern Illinois look up to northern Illinois and to Elgin for inspiration and for help. We come up here to learn the lessons that you gentlemen have worked out by long years of study and experience.

We come here not so much on our part from southern Illinois to say anything that may be instructive, and possibly not even interesting, but we come here to learn. We come here as students to try and find out something about the great practical question of running a dairy, of producing a dairy cow and of meeting the thousand and one problems that are to be met in this great problem of running a dairy farm.

I have no doubt but that there are hundreds, and I might say thousands in this neighborhood, who are devoting the greater part of their energies to the question of dairy farming and have gone along for years so imbued with their work they have not appreciated the importance of the things they are doing. We can see that back in Egypt where we have not had this interest developed.

In our country they gave it the name of Egypt because when the early settlers of Illinois had failures of crops they came down to us to get corn, and they gave us in the southern part of Illinois the name of Egypt, going back to the early history of the human race, but it has been so easy to make a living down there. It re-

quired so little work that we have not advanced in these great practical questions of the sensible way of running agriculture and especially a dairy farm, but we have reached the point, which many places in the great State of Illinois has reached today that have followed the same tactics of wearing out that fertility of the soil that nature has given us, where we must have means of restoring what we have taken away. A few of us, and I am glad to say the number is increasing rapidly, are beginning to get our eyes open and see that the great future of that country, blessed with sunshine and rain and a fine climate, if we are to produce a dairy cow of the proper kind and develop our interests to building up dairy farms, must develop along scientific and business lines the great business of dairy farming.

I have heard people say on that question that we would get too many people raising cows and produce too much milk, but that is a fallacy. There are none of us who will live long enough to see the over production of milk in the State of Illinois, or in this country.

We know as a matter of fact that the population of the United States increased in the last decade over twenty millions and the production of milk in the United States has decreased below what it was ten years ago. We know that on all of the food lines that go into human consumption, that while the population has increased the pro rata production has decreased in the United States.

We have heard recently a great deal of talk about the high cost of food stock and some politicians in Congress thought they would make capital for themselves. These hair-brained politicians introduced a resolution whereby they secured twenty-five thousand dollars to make an investigation, when any person who had ordinary brains and common sense knew that politics did not affect the price. It was affected by the great law of supply and demand. After that committee had spent that twenty-five thousand dollars to find this out the whole thing was hushed up. I mention this because it seems appropriate at a dairy meeting to think about it.

There is never going to be a time of cheap food production;

the fact is that in the last ten years the agricultural interests in America have been getting a fair recompense and now they have got it they are going to hold it, not altogether on account of their selfishness, but because ninety millions of people of this country have got to be fed and this great onrush that has been going on for the last thirty years, taking the boys from the farms and putting them in the offices has taken away and has sapped the blood, the brains and the sinew that was necessary to maintain the greatest industry of this Republic.

Then there is a further responsibility that rests upon us and that is to develop the great opportunities that lie before us and to have the manhood not to shirk the responsibility.

We have read in times past of famines in the great nations and would it require a great stretch of imagination to see this country in fifty years time with its increase in population and a decrease in its production, to see the United States of America on the verge of a famine. We have been selling the fertility of the soil, so I say there is a responsibility that we should not shirk. It is the responsibility of feeding the people of this country for the next fifty years and that can be done only by conserving the resources of this country on the farm.

Without criticism of those who have been having great headlines in the papers about the conservation of the country, the thing that comes to us is getting down to the bottom of conserving the resources, and that can only be done by the farmer.

You cannot take your land in Kane county that was producing thirty or forty years ago forty or sixty bushels of corn to the acre without the care and scientific attention that it should receive until you get down to twenty-five bushels an acre, you cannot follow that policy, for if you did the end would come in the life time of many of us. You must produce enough to sustain the life of the community.

This great problem rests with the men who have the courage and the energy to meet these problems. No food that the world has ever known has the sustaining quality of good pure milk. No food can be produced as economically and as well as good pure milk. and when you are doing that with a proper sys-

tem of management upon your farm you build up the fertility of the soil so in ten years your farm is a hundred per cent better than when you started. Then, and in that manner the people are going to meet this responsibility that rests upon them.

I have heard it said in times past the objection to it was that it required labor and that it was a drudgery. This one lesson every one ought to know, that there is nothing worth having in this world that is not gotten at the price of labor. You cannot do anything without labor, but we do not need to make the life of a dairy farmer a drudgery; have a system to it; do not waste too much time; make every lick tell; have your organization so perfect that you do not need to work eighteen hours out of twenty-four.

I am just talking at random here because I had not prepared any set speech. I get so full of these subjects that I could talk until you were tired and weary.

I will announce at this time that aside from being connected with the Dairy Association I am President of the Holstein Breeders' Association and it would not be proper to make a Holstein speech at a general dairy meeting because there may be some Jersey fellows here who would be offended, or there may be Guernsey fellows, but I will take the liberty of saying this, we of the Holstein Breeders' Association who happen to be at the head of affairs this year have had a great admiration as Holstein men of this territory for what you have been doing, and we decided at this meeting to have a state meeting of the Holstein breeders, not to interfere with the State Dairy Association, but after it is over, we could invite all men who own Holstein cows and those who believe that they or their children want to own Holstein cows to come to a meeting that will not interfere with this dairy meeting and hear us talk and sing the praises of the Holstein cow.

After this meeting is over this afternoon, I suppose it will be about 4:30, we want every Holstein breeder that can come into the town of Elgin to come in this corner and we will have a love feast that is worth having. I thank you.

President: Mr. Mason has something he wants to ask you.

Mr. Mason: Do you grow alfalfa in your section?

Judge Lynch: Yes, we have some good sections, but we have this difficulty, we are not blessed with the fertility of the soil. Nature in making southern Illinois made it deficient in vegetable matter. From the water it has become acid, so our soil is not fit by nature to do many things that you can do in the northern part of Illinois.

I started out to say that there is nothing you cannot do with your brains and energy behind it.

The thing to do with alfalfa is to find out what the deficiencies of the soil are, why it will not grow. When you find that out go to work and overcome it.

I found the first thing to do is to put some ground limestone in and this puts the soil in a better physical condition. Then have the ground well drained. Alfalfa will not stand wet food.

Mr. Mason: Will tile work there?

Judge Lynch: Yes, on the hard pan that never bothers us at all. That is assigned as the reason, but get behind it and study it, there is some other reason. It is more in the failure of the man than of the soil. I find that if you take and put ground limestone to overcome the acid, then give it all the fertility you can by fertilizing all your barn manure, get your ground in thorough cultivation.

I would advise that you plow your ground early in the spring and until the first of July disk it every two weeks. This will accomplish two things: First, kill the weeds; the other is by that kind of cultivation it will retain the moisture; I do not care how dry it gets after July first, your alfalfa will grow and you will make a success of it. There is not a foot of ground in Illinois where you cannot make alfalfa grow under proper conditions.

Mr. Mason: When do you sow the seed?

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A Prize Winner at the National Dairy Show, Chicago.

Judge Lynch: In April, May, June, July, August and October; but the best results are in July and August.

Mr. Mason: Do you use silos?

Judge Lynch: We are getting started on them; we have a number, but nothing like we ought to have or nothing that I think we will have in the near future.

Mr. Mason: In northern Illinois I think it is better to sow the alfalfa seed in June or July.

Judge Lynch: Possibly, although I would rather think the first of July would be better for you here. That would give you time to cultivate the land before you sowed it; good thorough cultivation before you started the seed.

Mr. Mason: How much do you think it advisable to sow to the acre?

Judge Lynch: I think it advisable to sow 20 pounds to the acre. The best seed will cost you from eighteen to twenty cents a pound and you can buy it as cheap as fourteen cents. You had better pay twenty cents, if necessary, to get a good seed; the question of a few cents on the pound, when you take into consideration your time in getting alfalfa started, is not worth considering.

Mr. Mason: How much do you cultivate it, and when?

Judge Lynch: That is experimental. There are many people who disk their alfalfa once or twice a year, not deep enough to drain the ground.

On the question of seed, I might suggest that you want to be careful and get it from non-irrigated ground; seed grown on irrigated ground does not give good results. Wisconsin seed is almost always good.

Mr. Mason: How many tons do you get to the acre?

Judge Lynch: From two to three tons. If the season is good we can usually get four crops, but always three crops. It ought to average four to five tons per acre each year.

Member: How would Kansas seed do?

Judge Lynch: If it was not from along some irrigated ditches it would be all right.

Mr. Mason: Do you top dress the alfalfa?

Judge Lynch: I think it an advisable thing to do. It helps to maintain the fertility of the soil in replacing the phosphorous and other minerals and it also acts as a protection against the winter.

Mr. Mason: Do you leave the top dressing all winter?

Judge Lynch: I would never cut it so there would not be some growth before winter.

President: Is Mr. Dickerson present? If so, I am sure he would like to give us a little help on alfalfa. Won't you tell us what you are doing on your farm?

Mr. Dickerson—Growing Alfalfa.

I did not come here with the intention of saying anything about alfalfa. I came to listen, but not to expound my theories.

We have grown alfalfa for three years. We have grown it successfully where the gravel comes near the surface and we are growing it at the rate of from four and a half and five tons to the acre.

This year we got two tons to the acre the first cutting, the second cutting there was nearly two tons, and the last cutting we got over a half ton, and it still had time to grow and leave enough on the ground so it will hold some of the snow and protect it during the winter.

The greatest difficulty is in getting the first crop cured, as it is generally ready to cut at the rainy season in the early part of the summer, along the latter part of June.

We have found it a great help after the alfalfa has been cut, and partially dried, to cock it and cover it with a hay cap. Two years ago we saved more than the price of the hay caps in the first cutting by having them ready to put on the alfalfa. We cut on Monday, cocked it in the afternoon and put on the hay caps the next morning. It rained all that week, the next Monday we had almost as good hay as the next cutting, which was cut without any rain; so much for the hay caps.

In growing alfalfa, I think it is absolutely essential it should be cured either in the cut or in the windrow. If you cock it up it takes a long while to dry out. I think the best thing to do with alfalfa, unless the season is too rainy, is to rake and turn it over often. It does not do to let it dry in the sun because you lose the leaves, the most nutritious part. It must be cured in the windrow or in the cock if you want to get the best quality.

President: Are there any questions you would like to ask Mr. Dickerson?

Member: Do you have any trouble in the heating of the barn?

Mr. Dickerson: No, we have had no trouble. This year the first crop was put in damp; some said it would spoil. It has come out very nicely. I think you can put alfalfa hay in the barn a little wetter than clover. It is dangerous to put hay in the barn wet from dew or rain. If it is the dampness from the plant itself I think you can put it in pretty reasonably heavy.

We have not attempted to raise alfalfa by growing a nurse crop with it, for the reason that I felt if we attempted to grow a nurse crop it would dry out during the summer. I think it could be done on a richer soil.

We plant our alfalfa the latter part of September or the latter part of August. The first year we kept it disked up to the

time we planted the seed, then we sowed it. We had trouble with weeds. We kept running the haying machine over it and that was the only thing that saved it; the frost killed the weeds.

The next season was dry; we ploughed the ground in July, we sowed the alfalfa as soon as we could work up the ground after the rain and I do not think there was a weed on the place. We happened to hit it right and it was very clean this year.

Member: Do you think the weeds do more harm than a thin nurse crop?

Mr. Dickerson: I would think so, because the young alfalfa plant is very tender and a few weeds do it a great deal of damage; and then another reason why the soil needs to be very thoroughly prepared if you expect to successfully grow alfalfa on account of the young plant being so tender it needs a fine bed, but when it has a firm hold there seems to be little danger of killing it. It will stand a lot of disking. We set the disks so they cover up a lot of the plant. We cannot set it deep enough after two years so it will cut those roots out. It is surprising the way alfalfa grows after such treatment.

Member: Is it harder to grow alfalfa than red clover?

Mr. Dickerson: No, it is not.

Member: When do you cut the alfalfa?

Mr. Dickerson: We go about it this way, we cut the alfalfa as soon as the young shoot begins to appear, when the young plants are about one-fourth in blossom; soon after that the leaves begin to drop off. I have noticed that soon after it began to blossom it was not long before one-half of the leaves were on the ground.

Mr. Mason: How do you think the ensilage keeps in the cement silo?

Mr. Dickerson: We have never lost any ensilage in the cement silo. It keeps just as well in a cement silo as it does in any other. We have one that was put up by a Chicago concern, it is a double silo. The other silos we built ourselves and made a solid wall seven inches thick. If anything the silage keeps best in the solid wall silo.

We open it up about the first of February and we find very little frost in it. The double wall is on the north side and the single one is on the south side; on the north side about a ton stuck to the wall and it stayed there until some warm days, and by spreading it there was no trouble in getting the cows to eat it.

Member: Do you put salt in the alfalfa?

Mr. Dickerson: No, we do not.

Member: Are your silos made of solid walls?

Mr. Dickerson: Yes.

Member: Which is the better time to start alfalfa, in the spring or fall?

Mr. Dickerson: It altogether depends upon conditions. With us where the gravel comes near the surface, I think the fall is best.

President: Mr. Caven has some announcements he would like to make.

Mr. Caven: I know the thing that interests the creamery butter makers the most is the butter room which is on the balcony. The butter room will be open immediately after dinner and the butter judging will begin at that time.

Mr. Hepburn, who is in charge of the butter contest, will announce this afternoon the arrangements for holding that contest.

Members of the membership committee may be found almost anywhere in the room but if any one who wants a membership doesn't find a member of the committee, he can get it at the Association office near the door.

We have here the published report of our last year's Convention and these contain a lot of good dairy information and we want you to take them and read them. The State makes an appropriation to help us publish these reports so on that account we can give them out and we want them in the hands of men who will read them and can derive some benefit from them.

I want to announce, for fear some one is here who will not be here this afternoon, that there will be a lecture by Dean Davenport of Illinois College of Agriculture this evening. He is an interesting talker and I know all will appreciate his lecture. There will be some music besides the lecture, and after the lecture the members of the Association are to be entertained over at the Elks Club. Of course we cannot include the ladies as that is one particular part of this program where the ladies do not appear. Even if the ladies are not there it will be a very nice affair, and one that I know all of our members will enjoy.

Mr. Mason: I would like to hear from Mr. Turner about five minutes and have him tell us how they grow alfalfa in McHenry County.

Mr. Turner: I want to say that instead of telling this audience how hard it is to raise alfalfa, I want to say how easy it is. We have gotten fine results and though you have heard that the summer or fall is the best time to start alfalfa I believe the spring is the best time. We follow Governor Hoard's instructions.

Mr. Mason: Do you have any trouble in starting it?

Mr. Turner: We have no trouble at all when we start it in the spring. There is nothing like alfalfa, everything likes to eat it.

Mr. Mason: We will adjourn until 1:30 this afternoon. We want to get started on time, we have three good speakers.

Tuesday Afternoon, January 17, 1911.

PRACTICAL DAIRY SUGGESTIONS.

By

S. B. Shilling.

President: We will open this afternoon's session with a talk from Mr. Shilling, a man who will make you smile as Mr. Mason says. He will talk to you about Practical Dairy Suggestions and anything else that comes in his mind. I know you are all so well acquainted with Mr. Shilling that he needs no introduction from me.

Mr. Shilling: Mr. Chairman, Ladies and gentlemen—I cannot understand these surroundings up here. It does not look as though this platform was ever intended for a man to stand on and speak to you from, except a man who feels embarrassed when he faces an Elgin audience.

I said to a man as I came into the room today that I felt uneasy and embarrassed when I undertook to talk to an audience like the farmers and citizens in the Elgin district. I said that I could not help but feel that I could not tell you anything but what you already knew, and that you were probably in advance of anything I could tell you about. He said that you did not know any more than we did and when I come to think, that when I came through the country and saw that only about one farm in five had a silo I concluded that you did not know any too much.

Now I am not going to take a great deal of your time this afternoon. I talked to you last night but there are a few things in relation to dairying that I wish to touch on briefly, and if there

is one thing above another that I wish to talk about, it is quality, and I would have that commence at the cow and continue to the milk and butter that you furnish to the consumer, to the creamery or to the milkman.

I believe the dairy industry has never stood in as critical a condition as it does at the present time and I have arrived at that conclusion from the fact that we have a surplus of forty-five millions of pounds of butter on hand at this time. Inside of the last two weeks butter has dropped ten cents a pound, an unusual condition, and it is this that I mean when I refer to the critical condition of the dairy interests of this country. The main reason for this accumulation is the poor quality of the product we are offering for sale. It would be different if it were not for a substitute that is on the market that the people can turn to for consumptive purposes, and I refer to oleomargarine.

I do not believe that the consuming public want oleomargarine in the place of butter, but I do believe we are up against this fact, that the consuming public is going to use oleomargarine rather than use poor butter. That is the condition that faces us today, and the man who is producing the poor raw material has got to quit the business. I firmly believe it. Years ago, I made this prophesy and the facts have borne me out. I did not then believe we would ever see the time in dairying when we would see butter or dairy products cheap again. I am ready to make this prediction. I do not believe we will ever see a time when there will be cheap food or feed products. The facts are that the production of these products is dropping gradually behind the consumption of them; and, while it was slight for the last ten years, the records show that there was a five per cent increase in the population.

Yet, ladies and gentlemen, if I might talk politics in the face of these facts, in the face of the decrease in the production Congress appointed a committee for the purpose of inquiring into the high cost of living. After spending fifteen thousand dollars and asking for fifty thousand more to continue the investigation, which was properly turned down, the majority or

the Republican members of the committee gave a woman's reason "because" and the minority or the Democratic members said it was the tariff. It makes me think of Champ Clark's story about the tariff. It was about the horse thief who was hung to a tree out West and a card was placed on the body which read, "This man in some respects is a mighty mean man and a damned sight meaner in others."

Now I believe firmly what I told you to start with, that we are facing a critical position in the dairy industry of this country. I do not believe that the people would not be willing to pay for butter if it was fine enough, but it has been refused simply because of the quality of the great bulk of it. But I believe this, that we must look to quality, and that applies to you in this great Elgin district.

If I was going to urge one thing upon you today above another I would urge better cows. Now I think that with you this should be the first consideration. I do not believe that you are paying enough attention to the cost of production. You do not know enough about what you are doing. You have not got that important part of the question down to the point you ought to have it. You do not pay enough attention to the kind of cows you have.

You do not appreciate the possibilities of the true dairy cow. I believe today that in the breeding and in the feeding of this animal we are merely scratching the surface in knowledge; we do not know what is possible.

In Illinois and also Iowa the average amount of butter fat per cow is only 140 pounds. It is no wonder that men throughout Iowa as well as this state can see no profit in dairying. Contrast this with a cow in Wisconsin that, by intelligent breeding and intelligent feeding, produced a thousand pounds of butter fat per year. Think of the difference. Both cows looked alike in a certain way. They were both cows. But think of the average cow of the state of Iowa only producing one hundred and forty pounds and this cow in Wisconsin that produces 1,000 pounds within a year. I see a good many look skeptical at that statement but I believe it is right. I believe it is correct. I be-

lieve another thing, that what is possible for that man to do in Wisconsin is possible for us to do in the states of Illinois and Iowa.

While we have a hundred and forty pounds on an average to the cow in the state of Iowa, I also know of herds that are producing three hundred and four hundred pounds and more. I simply tell you this to illustrate what I mean by saying we do not understand the possibilities of the true dairy cow.

Dairying is a deep subject, a subject for study, and with all of the knowledge we now possess, there is no danger of our getting too much.

I would like to urge upon you the necessity of first looking to the dairy cow. I do not believe it is my mission to stand before you and advocate any particular breed, they are all good. I do not believe that to the average farmer it makes any difference whether it is a black or white, whether it is a Jersey or whether it is a Guernsey. It is a cow that gives a return for her feed that we need. Nor would I advocate that you immediately jump from what you are using into thoroughbred cows.

In this district I believe there is more attention paid to the breed than in almost any other, but don't under any consideration use anything except a known thoroughbred dairy sire. After you have your dairy herds and are able to figure out a profit, look to the quality of your product.

I know nothing of the milk industry, probably three-fourths of your people are furnishing a milk product for city consumption, but I do know the conditions of the butter producing sections today. There is a big surplus of both butter and cheese. The same conditions confront us in the manufacture of both butter and cheese, and I know that in these it pays to produce a good raw material.

The next question of the greatest importance to successful dairying is the feed after you have gotten the cow, and I wish to talk a little about the silo. I want to start out with this assertion. I am a farmer in the state of Iowa, not a good one, not as good as you, but one that is trying to learn from experi-

ence. While our lands are not as valuable as yours, I want to say this, I want to say it because I believe it, that if I did not have a silo I could not afford to keep the farm.

This is a subject up to you, and I believe that it is only a question of time before you must get more off your land to the acre, and I do not believe that there is anything equal to the feeding value of corn that you put into your silo. I hardly know how to handle this part of her subject. It does not seem to me that intelligent men in any community could afford to be without a silo. I will go even further and say, that there is nothing that I would advise a man that owns a forty or so acre farm to mortgage his farm for except to get money to build a silo. I believe it will give him the biggest returns for his investment.

I do not wish to advocate that this is the only feed, but I do believe just what I tell you that we cannot afford in this or any other community to get along without one.

The two questions I came here to discuss above all others is this question of quality and this question of silo, the cheapening of feed on the dairy farm.

You are already a dairy section and I would be wasting my time and yours if I undertook to enlarge upon the benefits you derive from it, but I know that in parts of the country you are not as advanced as you should be.

I believe there are these two important points in dairying that we must not lose sight of. I am sorry there has not been an opportunity of becoming more familiar with what the producers of market milk are up against. I imagine the difficulties must be fully as great, if not greater, than we have in the production of a finished article.

Another thing, although our market in butter is in a critical condition, I am just as firm in the belief as I ever was that we never will overdo the production of dairy products provided we produce the best quality. I believe today it is the only solution of the oleomargarine question. The poor butter is the only thing that has let oleomargarine into the market. If we produce a fine enough product we will relegate oleomargarine to where it belongs.

SELECTING DAIRY COWS.

ByHugh G. Van Pelt, Waterloo, Iowa.

President: We are exceedingly fortunate this afternoon to have with us Prof. Hugh G. Van Pelt, of Iowa, who is in charge of the dairy work of that state. Will you have a specimen cow brought in, Mr. Gilkerson? Prof. Van Pelt will talk a few minutes about the cow that is brought on the platform and give us an interesting discussion. I take pleasure in introducing Mr. Van Pelt.

Mr. Van Pelt: Ladies and Gentlemen: It always seems that when I come to a state dairy association meeting I am compelled to suffer the embarrassment of following my friend, Mr. Schilling. We all know and appreciate the manner in which he can talk and I always feel quite humiliated in trying to speak after one of his excellent addresses.

I was very much interested in what Mr. Schilling had to tell you about the Iowa cow, namely, that she averages only 140 pounds of butter annually. I am not going to tell you that your cow does not average more, but it is true that the average cow of the United States is not doing any better than the Iowa cow. In that state where we are milking 1,500,000 cows, we have thousands that are producing 300 pounds of butter in a year, hundreds that are yielding 400 pounds, scores of them that are producing 500 pounds, dozens of them 600 pounds and many individual cows that are producing from 600 to over 1,000 pounds. In view of this and the fact that the average is only 140 pounds, you can readily see that there are a tremendous number of cows producing less than 140 pounds of butter annually.

This really is the situation and I want to say to you that I believe it occurs in your district as well as in others, unless you

are advanced in dairying to a point where you make a study of the individual cow.

There are good cows and poor cows all over this country. Which are the good cows and which are the poor cows is a problem that must be solved. In our state we are making strenuous efforts to determine the good cows and eliminate the poor ones.

In my experience I have never seen a herd but that some cows in it were profitable and some were unprofitable, simply eating up a portion of the profits that the good cows were making. In testing associations which we have organized in Iowa we find many peculiar instances. Often times in one and the same herd will be found two cows standing side by side, one of which when her record has been kept for a year will have produced 100 pounds of butter, while the other kept under identically the same conditions, being fed by the same feeder, milked by the same milker, given the same foods in amounts and quality, will have produced according to the scales and Babcock test, 400 pounds of butter during the same period of time.

Let us take for granted that it costs \$29 a year to feed the first cow and that her butter sells for 30 cents a pound, yielding a gross income for her owner of \$30. Figure the net profit and it is not difficult to ascertain that this cow has made for her owner \$1 net profit, after allowing the skim-milk, calf and fertilizing ingredients of the offal to pay for the labor expended upon her. In other words, the dairyman or farmer has contented himself with milking a cow over 700 times for a net profit of \$1.

We, as farmers and dairymen, are prone to complain about the drudgery on the dairy farm and about the scarcity and high price of farm labor. Still the proprietor of a farm, one of the great factories of the United States, is willing to sit under a cow night and morning over 700 times a year and milk her for the meager profit of \$1.

Considering her stable companion, however, that has made 400 pounds of butter, which when sold at 30 cents per pound, will return \$120, she may be fed \$60 worth of feed and still return a net profit of \$60 for her owner. It means that this cow, making

60 times as much profit as the other cow, is worth at least a whole herd, numbering 60, of the less productive type.

This is the condition that faces the American farmer and dairyman today and he, and he alone, can by intelligent methods so select and care for his cows as to make them all return him a large percentage of profit.

On the other hand we realize that your farms are your farms and your cows are your cows, and you are at liberty to do as you like. You can milk one cow for a year and make a net profit of \$60 or you can milk 60 cows for the same period of time in order to make the same amount of profit. In other words, you can milk one cow one year to make a profit of \$60 or you can milk the same kind of an old cow 60 years in order to make the same \$60 of profit.

However, we know the American farmer well enough to be certain that he will not knowingly milk a whole herd of cows to make the profit which one cow should make, and those who are willing to take time to weigh and test each individual cow's milk to determine which cow is which can readily sort out and retain only the profitable cows for their future herds.

As farmers we should realize that in reality the farmer is a manufacturer. Our farms are the greatest manufacturing plants in the world and every animal that we have on them, no matter what else it may be, is a machine placed there for the purpose of manufacturing finished products out of the raw materials, the grains and grasses grown in the fields. And I say to you that the farmers of the United States will never reach their highest plane of dignity until they realize their positions in commercialism as manufacturers.

It is a well known fact that greater percentages of profit can be made from raw materials by using efficient machines, those that are durable and capacious, than machines that are out of date and wasteful. When we will accept the highest type of present day machines for the manufacture of milk and butter fat and then give them the proper care and treatment which is due them, we will have solved both of the problems Mr. Schilling has

spoken to you about. We will thereby gain in both quantity and quality of production and by so doing will have demonstrated that our farms are the greatest factories on earth.

You say to me if we all had good cows there would be no market for the butter. However, I am confident in our lives we will never see the time when there will not be a demand for all the good butter that can be produced.

Thirty-five years ago there were being milked in the United States 11,000,000 cows. Today there are 22,000,000. During this thirty-five years our population has doubled and in the next thirty-five years we can expect our population to double again. In case it does, one of two things will be necessary if the people of this country are to use dairy products to the same extent per capita as they are now. It will be necessary either to milk twice the number of cows or to double the average production. Milking twice as many cows, or 44,000,000, would add greatly to the drudgery, for it will take more labor and they will consume much more feed. All things considered the best solution is to milk the same number of cows and by the use of better methods in caring for our herds by selecting and retaining one or more profitable individuals and by the use of good sires in building up these herds.

It will not be a difficult matter to induce your cows to yield double their present amount of butter fat. After that has been done there will still be the possibility of doubling the production again.

As Mr. Schilling has said, if you could realize the wonderful possibilities on the farm today for those who will solve just this kind of problems, you would be surprised at the wonderful results that can be accomplished.

I believe that one-third of the 22 million cows being milked in the United States are not any more than paying for their feed, another third are being milked at an absolute loss, which means that all of the profit that is being made from dairying is derived from one-third of the cows while the remaining cows that are

now being milked are eating up a portion of the profits that this small percentage of individuals are making.

Were we to allow ten minutes for milking and feeding each of the unprofitable cows that are now being milked in the United States 700 times a year, then divide this time up among the farmers in the United States, we would find that on the average farm some man wastes annually 27.2 ten hour days each year. This is practically a month and represents the farmer's vacation, which he does not get. He has chosen to milk during his vacation period while the business man goes abroad. These are merely facts and all the man who milks cows needs to do to prove them is to join a testing association or begin regularly to weigh and test the milk of his cows. The only reason we are milking unprofitable cows today is because we have not realized the value of the milk scales and Babcock test, or, in other words, we have not made a study of the individual cow.

In fact, there are many most excellent lessons that are to be learned about cows, their selection, their feed, care, etc., that can be learned only from the cows themselves, and, as much as I appreciate those lessons which I have learned out of dairy papers, books and in school, the greatest lessons I have ever learned have been taught me by the cow herself.

In addition to the use of the Babcock test and scales there are many points to be considered in selecting and judging dairy cattle and, using this cow as an illustration, I will try and make plain the essential points to be observed in selecting dairy cows. If during my talk there are any questions you would wish to ask I will be glad to answer them for you.

There are five essential points that must be present in the make up of any cow if she be highly productive, and the absence of any one of these points is proof that the cow is either not productive or that she will not remain productive over a long period of time. These points may be enumerated as constitution, capacity, nervous temperament or disposition to work, blood circulation and the ability to convert feed nutrients into milk and butter

fat. Considering these, one at a time, it is always well to begin at the head.

Constitution is indicated, first by large nostrils. Nothing purifies the blood except oxygen and no oxygen ever reaches the lungs and comes in contact with the blood except through the air which the animal breathes. If the nostrils are small the amount of air is limited or the cow must breathe twice as rapidly as if her nostrils were larger. The respiration of cows is practically the same. Therefore, cows with small nostrils do not take into their lungs the same great amount of fresh air and oxygen that cows with larger nostrils do. Passing back it is desirable that the cow be deep from the top of the shoulder to the floor of the chest, well spring in the front ribs and deep in the heart girth. A cow that is shallow in the chest and heart girth and slab-sided in the front ribs is considered lacking in constitution. It should be remembered that the dairy cow is an extremely hard worked animal. A cow that will produce in one year 18,000 pounds or even 10,000 pounds of milk has accomplished more in providing food for mankind than three or four steers working the same length of time would have done. Because of the fact that she works as persistently as she does and that she is stabled six or eight months out of each year in a barn which is too often cold, dark, damp and poorly ventilated, where she is subjected to disease germs of tuberculosis, cow pneumonia, garget, contagious abortion and other diseases, it is absolutely necessary that all indications of rugged constitution be well developed. I appreciate the fact that in this community you build your barns with a great number of windows so that the light, sunshine and fresh air can enter them.

In Iowa and in other states where I have traveled it is very seldom that more than one or two very small windows are to be seen even in great, magnificent farm barns that have been built at great expense. It should be realized that whenever barns are built and boarded up tight without windows or fresh air ducts the light, sunshine and fresh air, which cost nothing and are ab-

solutely essential to maintain the cow's health and make it possible for her to do her best work, are shut out.

The next point for consideration is capacity. Beginning again at the head, you will notice on this cow the extremely large mouth. Any animal with a large mouth is a good feeder. I have never seen an animal with a small mouth that was a good feeder. Just as truly as it is necessary for a cow to consume large amounts of food in order to prove herself profitable it is necessary that her mouth be well distended and large. Passing back, the body should be long from the shoulders to the hip bone. The ribs should be well sprung and deep, giving dimensions for a large capacity or storage room, namely,— length, breadth and depth. Size of barrel is an indication of the amount of food that the cow can consume at one time, but with this consideration should also be considered the degree of thoroughness with which the cow digests and assimilates her food. Any portion of the food which passes off undigested is wasted, and worse than wasted, because it taxes the cow's digestive apparatus without producing any gain. The strength and power of a cow's digestive apparatus is indicated to a large degree by the character of the hide and hair.

You have all noticed in the show rings the judge lift up the hide and hair with his hand. It is impossible for him to look into the cow to determine the character of her digestive system, but he can turn his face away and by the touch or handling qualities of the hide and hair there is conveyed to him by his sense of touch as indicated by the hide and hair the condition of the inner and vital organs of the cow. In other words, the hide and hair is an outward continuation of the inner organs of the beast. If the hide is hard and stiff or the hair wiry and harsh then there is something wrong either temporarily or permanently with the cow's digestive apparatus. If the cow's hide is soft and pliable, covered with hair that is oily, soft and silky then the indication is that her digestive organs and her circulation are in good active condition and that she will not only consume large amounts of food at one time, but she will digest it readily and thoroughly and soon be ready for another feed. It is more desirable that a cow

have a large body, yet a small barrel, covered with hide and hair of the proper texture and handling qualities, than a large barrel covered with a hide and hair of inferior quality.

The two points, constitution and capacity, are both essential.

The third point is the question of whether the cow is a worker or a loafer. If you have been watching this cow you have noticed that she has been working every minute since she has been up here on the stage. Whenever a cow chews her cud she is working and the persistency with which the cow eats and chews her cud is a good indication of her nervous temperament.

Another important indication is the size and character of the eye. The cow's face should be broad between the eyes, well dished, and her eyes should be prominent, bright, placid and alert. The animal with dull, sluggish eyes set back in the head is as a rule a loafer, standing under the shade of a tree fighting flies in the summer time, while her sisters are grazing back and forth across the pastures gathering food for the economical and profitable production of milk and butter fat.

A further indication of the proper nervous temperament is the prominent and open jointedness of the backbone. You will notice as I pass my hand along this cow's back each of the spinal vertebrae stand out prominently with absolutely no covering of beef or fat. This is an indication that every pound of food this cow has consumed, outside of what has been necessary for her own maintenance, has been converted into milk and butter fat. Were this a beef animal, right and ready for market, you would find stored up and evenly distributed along her back from $2\frac{1}{2}$ to 4 inches of fat or beef. Every pound of food consumed by the cow that is manufactured into beef is lost and wasted from the dairyman's standpoint. For this reason the animal which converts its food into beef and stores it on its back regardless of what breed it belongs to is a loafer from the standpoint of butter production. The same is true relative to other regions of the animal and you will notice the absolute freedom from beefiness throughout this cow's entire contour.

The fourth essential point to be considered in selecting dairy

cows is the blood circulation. To be of the productive type the cow must not only have an abundant flow of blood, but the course of circulation must be through the proper channels and in the right direction. Herein lies the great difference between beef and dairy bred animals. If you will study the workings of these two classes of machines you will find that up to the point where the food has been masticated the process of consumption and digestion are practically the same. After the food has been digested in the case of the beef animal the blood is pumped out from the heart along the digestive apparatus, the digested nutrients picked up or assimilated and carried by the blood upward and deposited over the shoulder and chine or back, the ribs, the loins, over the hips and rump and into the hind quarters. The flow of blood is thus directed carrying all nutrients, because for hundreds of years beef cattle have been bred by intelligent breeders for the specific purpose of consuming a large amount of food, digesting, assimilating and depositing it over these regions of the body because years ago the packer informed the breeder of beef cattle that the ultimatum of all his efforts was the block and if he desired to secure from 6 to 8 cents a pound for his steers instead of from 3 to 4 cents a pound then it was necessary to breed animals the offspring of which would utilize their food in developing the high priced cuts, namely, the porterhouse steaks and rib roasts which the consuming public were willing to pay for. The success with which the breeder of beef cattle has met is demonstrated at our state fairs and fat stock shows by a careful observation of the cattle exhibited.

On the other hand when the real dairy cow has digested her food the blood is pumped out from the heart past the digestive apparatus, picking up the digested nutrients and carrying them not up on top of their backs, but around through the udder where milk and butter fat are made. The first indication of the amount of blood passing into the udder is often at the escutcheon, a portion just above the rear of the udder where the hair grows upward on each side of which the hair grows downward. It is believed that the hair covering the escutcheon is nourished by the

blood in the vessels which are passing to the udder. An indication which determines more accurately, I believe, the amount of blood passing through the udder is found in the mammary veins. All cows have two of these veins, one on each side of the abdomen. Some cows have short straight veins ending in a small milk well. Other cows have veins that are large and tortuous, extending far forward, as do the veins of this cow, to a large milk well, an opening in the abdomen large enough to insert my thumb, and passing on to a second milk well and some times on to a third or fourth. These are termed double extension veins. Some cows have three veins, one extending forward from the udder along the center of the abdomen between the two outside veins. Such a vein is termed a center extension. The size, length and tortuousness of these veins together with the number and size of milk wells when found passing forward from the udder of the cow indicates the amount of blood that is circulated past the digestive apparatus, picking up food nutrients, carrying them to the udder and being rid of its load, is on the way back to the heart and lungs for purification and to be pumped back again. I have never seen a good cow with small, short, straight mammary veins and I have never seen a cow with large tortuous veins and large, numerous milk wells that was a poor cow. A consideration of the blood flow will determine largely the character of a cow from the standpoint of milk and butter fat production. Feed deposited on the back of the cow cannot be made into milk and on the other hand feed that is deposited by the blood in the udder of the cow cannot be manufactured into beef, and for this reason a dairy bred animal is considered from the standpoint of beef production as a scrub and likewise a beef bred animal from the standpoint of milk and butter fat production is a scrub. This is due to the fact that no animal can do two things with the same pound of food at the same time. In selecting animals whose ancestors have for hundreds of generations been bred for the purpose of putting their food on top of their backs and striving to induce these animals to turn the circulation of their blood around to the under line of the body instead of the top line is working against nature and

is quite as impossible as to produce high class rib roasts and porterhouse steaks on the backs of dairy bred cows.

The fifth essential is the ability the cow has to manufacture the digested food nutrients that have been brought to the udder by the blood, into milk and butter fat. Experience has demonstrated that certain types of udders have proven most efficient for this purpose.

The udder should be long, broad and of good texture. To gain length the udder must be attached high behind and extended far forward. You will notice on this cow that if a plumb bob were dropped from her hip downward the line would fall just in front of her udder. If it were dropped from the pin bone it would fall just behind the udder. Thus it is that good length from hip bones to pin bones is desired, for it is an indication of the length of udder development. Furthermore, it is desired that the tail head carry straight out. Cows that droop at the rump because of the law of correlation have tilted udders, or udders with a portion of the fore quarters sacrificed. On the other hand, cows that carry out straight at the tail head carry straight forward in udder development, adding to the size and capacity of front udder development.

As we turn this cow around you will notice that she is thin in the thighs, in fact, I measure the thigh with my thumb and finger and she goes up high behind. This conformation is necessary in order to have a wide udder and is the formation described by the term thighs out-curving and in-curving. An udder that is long and broad with each quarter well rounded out and a teat on each corner meets with the specifications relative to form.

However, many of you, perhaps, have owned cows with such udders that were disappointments. The reason likely was because the udder had no texture or quality. This cow not only has a large, well developed, shapely udder, but you will notice the presence of much quality and freedom from coarseness and beefiness, as indicated by the texture, pliability and elasticity of the covering. You will notice the blood vessels, which indicate that

branches from the large arteries are carrying the blood into the parts of the udder.

These are the five points and if you are milking a cow, any one of which are absent, you are not milking a cow, but only a part of a cow. For instance, supposing a cow is capable of eating a large amount of feed, but lacks constitution, she will not remain healthy and perhaps in a short time she will die. Granting her constitution without the proper nervous temperament or disposition to work she will consume just enough food to take care of herself. And if she lacks capacity, she can not eat enough feed to make a profit regardless of her disposition to do so. Given constitution, capacity and disposition to work, if her blood flows in the wrong direction, she will make beef instead of milk and then it will be necessary to kill her to get the cost of the feed back. And further than this, if the blood carries the nutrients into the udder, which has not the ability of extracting and manufacturing the nutrients into butter fat, still there is a loss. All of these points fit together in dovetail fashion and must be given due consideration in selecting cows for profit.

There are other points, such as width across the hips, breed, type and characteristics, but time does not permit reference to more than those points which are necessary for profitable milk and butter fat production.

But after all, when we have taken into consideration these points, we do not know much about the cow. There is no one in the audience who can look at this cow and tell within 1,000, 2,000 or 3,000 pounds how much milk she gave last year. If you could not see that she was a Holstein you could not tell within one or two per cent of how much her milk tested, were you to see a sample of it. The only way to determine the true measure of the cow is to use a scale each time the cow is milked and test her milk one or two days out of each month. It does not take long to do this and it is the only method of determining accurately the real merits of the cow from the dairyman's standpoint, and it is well worth while. Study the history of every great cow and you will find that at some time in her life she or some of her off-

spring were sacrificed because her real value had not at that time been determined.

Remember that in the United States farmers are milking 14 million cows, no one of which makes anybody a profit and that on the average farm in this country somebody is wasting 27.2 days every year.

By a combination of judgment and determining the development of the essential points for butter production and the use of the scales and test this great waste of feed and labor can be eliminated.

I thank you for your kind attention.

President: Mr. Van Pelt will judge the cattle in the exhibition and will explain the differences in the types as they appear.

We will stand adjourned until this evening at 8:00 o'clock.

Mr. Van Pelt, in the midst of an audience of interested listeners, proceeded with the examination of the animals in the show, describing the points of each animal and answering many questions. This part of the program was most interesting and instructive and occupied the remainder of the afternoon.



GRADING CREAM AND THE NECESSITY OF PAYING FOR QUALITY.

By

H. J. Credicott, Chicago.

George Caven, secretary of the association, read the address of H. J. Credicott, of Chicago, who was unable to be present. The subject was "Grading Cream and the Necessity of Paying for Quality."

It was as follows:

"Most creamery operators will not question the need of doing this, but many question the possibility without the serious loss of patronage and injury to their business.

"I hope to present the matter in such a way that the creamerymen may see that it has got to a question of necessity if they would stay in the business.

"For many years the butter business has been coming with a higher range of prices each year, and as a general proposition the creamery making the most butter would show the largest profits. The demand for butter was strong and the range in price between the grades very small. The strong demand caused much butter which was not strictly fancy to sell for full price, and if a creamery happened to make some badly off that the price had to be cut, it was only a matter of a cent or two.

Competition Is Strong.

"Under such conditions it was natural that the competition for cream should be strong and the matter of quality a secondary consideration with the consequence that the creamery patrons have not made very much progress in the production of fine cream.

"The past year has brought a sudden change in this respect. The price of butter has been very high. This has made the buyer more critical and as the high prices decreased consumption, the

buyer has become still more critical until at present we have a range of eight or nine cents between the selling price of fresh seconds and that of extra creamery butter. This is proving very expensive for the creameries making undergrade butter.

"I think most of the creameries that are not considering the immediate adoption of a system of grading cream and paying according to quality are holding off in the belief this situation is only temporary and will pass away with the beginning of a new season. I believe they are wrong in this idea. Regardless of whether the average is high or low the coming year the buyers of butter are going to continue to be critical in their selections. We have reached the time when low grade actually has got to compete with oleo both in a matter of price and comparative quality.

Oleo Used By Many People.

There will be plenty of people who will pay the price for fine butter, but the people who have formerly used the poor butter when a concession was made in price, have found oleo to be more satisfactory and are now refusing poor butter even at the same price as oleo. I have also noted a change in the selling of oleo in the last year. When it used to be sold in the retail store as best Iowa creamery, fancy Wisconsin creamery, fine Michigan creamery, best Elgin and many other terms calculated to make the purchaser believe that it was butter, is now being sold on its merits as oleo.

"The Chicago and Elgin butter dealers are about the only ones in the country who are not selling oleo as well as butter. Government figures on the oleo production show ever increasing amounts and we must face the fact of actual competition on merit. No creameryman will contend for a minute that he can afford to produce a grade of butter that will have to compete with oleo that can be manufactured to retail at from 11 to 22 cents.

Must Have Three Grades.

"In the grading of cream I believe we should have at least three grades and make such difference in price as is required by

the difference in market value of the butter produced from each grade. The usual argument presented grading and paying for quality is, 'If I don't take it at full price my competitor will.' In answer to this I can only say that as long as the present conditions continue the quickest way for you to get rid of your competition is to let them have the poor cream. The more they get of it at top prices the sooner they will cease to trouble you.

"There are other arguments I might present to you, such as the injustice of paying the man who produces poor cream the same price as the man who produces good cream, but I believe this thing will be settled from a moral standpoint. It is a cold cash proposition and the creamery that persists in taking poor cream will be wiped out of existence.

"The slogan must be changed from 'How much butter can I make to how much good butter can I make?' "



Tuesday Evening, January 17, 1911.

Joseph Newman: Ladies and Gentlemen, we will open our exercises tonight with singing by the Boys' Club of the High School under the direction of the music teacher, Miss Baer.

At the 37th annual meeting of the Illinois State Dairymen's Association I am glad to stand before you. Our President is a little shy and does not like to face this audience, so has asked me to take charge of the meeting, and I am always willing to do what little I can. I am a sidewalk dairyman.

We have with us tonight one of the leading dairymen of this section who will introduce the speaker, Mr. Judson D. Mason, of Elgin.

Mr. Mason: It is most appropriate to have with us a man like Professor Davenport. There is no section where there are more finely bred dairy cattle or better kept farms or better dairymen nor is there any place where there is better milk produced than in this Fox River Valley. We have with us a man who has done much in agricultural lines in Illinois and it gives me great pleasure to introduce Professor Eugene Davenport, Dean of our Agricultural College.

ILLINOIS COLLEGE OF AGRICULTURE.

By

Prof. E. Davenport, Dean.

Dean Davenport: Mr. President, Ladies and Gentlemen. I cannot come to you tonight altogether as a dairyman but rather, as your Vice President has said, as the representative of the College of Agriculture of this great State. That is not saying that I know absolutely nothing about the dairy business. I have always been a farmer, have lived longer on the farm than in the colleges. For years I was a commercial dairyman. I considered myself an expert dairyman. I am so far from home I can brag about it on this occasion.

I did not come here to talk about dairying but about the Agricultural College at the University of Illinois.

The subject as stated on the program is the Illinois College of Agriculture—It's Place as an Educational Institution in the State and Its Needs. What is it that the Agricultural College is doing I will tell you in just a few minutes. One thing it is teaching agriculture of various kinds to 750 students in the University, and this week and next there will be more than a thousand farmers and young men down to the University doing extra work. We are so full that we do not dare advertise this two weeks' course because if any more came than did last year we could not take care of them.

It offers eighty different courses, and it receives for two weeks in the winter all who come to study for those two weeks any phase of agriculture which they care to take up.

Another thing, it conducts experiments along practically every line in the agricultural field. Now one thing we must do in teaching and that is keep well within what we know on the subject. It does not do for a teacher to draw on his imagina-

tion; what he wants is facts. If I should tell you that a cow was red, white and blue, it would not make any difference. You do not care for anyone's opinion; it is facts you want. We must study within the known facts of the subject. Ten years ago it was different than it is today, and ten years from now it will be different from what it is today. I would not want to tell you what butter making was twenty-five years ago, it would take too long. What was called good dairying twenty years ago would not pass muster today and dairying today will not answer ten years from today.

If the College of Agriculture is going to get ready it must anticipate and get information by experimentation. One of the most common things right here is this, it isn't practical and it won't do. They pronounce judgment at once. A good many things have come to pass that at one time were not believed possible.

I knew twelve years ago we could not have rural delivery; it would cost too much, but we have it today. It is right here now all around us. If any one had told me twenty years ago we would be telephoning to Rio Janeiro I would not have believed him, and what we will be doing in ten years from now we dare not guess; but if the University is going to be ready it must do some experimental work, whether it pays or not.

The University of Illinois is doing investigation work, that is why the State of Illinois has put up a great deal of money to answer questions that will be asked twenty years from now; not to answer present day questions but questions that will be asked five or ten years from now. The State and the Institution that can look farthest ahead is the State or the Institution that is going to come out on top. Those are the people who will have the advantage.

A great deal of our work is experimental work, trying to find what you will want to know when the new times come. The University has no way of getting information quick; we have no wireless telegraphing system with the Almighty. If we are going to find out we must resort to the methods he has given

us, patience and investigation. We are looking ahead in our investigations and are not only teaching 750 students but are carrying on our investigations. We publish bulletins, we have published fifty thousand of them. There came to the University three or four wagons with bags, and those thirty-five bags contained one bulletin that the University had issued. You take fifty thousand books and they make a big pile. I have forgotten how many tons of printed matter we issued last year.

Another thing the University does is to conduct a heavy correspondence all over the world. We wrote 75,000 letters last year, so you will see we are doing something in the way of conducting a correspondence.

A man came to me and said: "I think it would be a good thing if you had a correspondence bureau." I said: "We have been having one for many years." He said: "I have thought out a good plan." I said: "If you have a plan, bring it up and we will talk it over, but we have one which we are following and last year turned out 75,000 letters." He nearly fell down; he was not thinking we were doing anything of this kind on so large a scale. He was thinking about running off such letters. That is not what you want. You will read a letter which somebody will dictate but I apprehend that if we should send a lot of work off, circular work which you are expected to read, I imagine the dairyman would not read it. We are carrying on a tremendous correspondence. That makes an information bureau.

Another thing we are doing is to attend a tremendous number of meetings, and so it is. Our people will address this year more than four hundred farmers' meetings in this state. It is too many in my opinion. There have been more meetings held than are properly supported. We are called upon too much to go 150 miles and speak to twenty-five people; it is a mistake. You are drawing on us so heavy you are injuring the work of the laboratory, and just because you can get some speakers out of our University for nothing. There is something for you to think about. To have this kind of a meeting there is no reason why twelve or so towns cannot get together and get a speaker.

I have traveled in this state 150 miles and have spoken to fewer people than I had in my classes. We must think this out. What are these meetings: they are farmers' institutes, schools in connection with the farm school, some are schools running for a week and some are special meetings. We are scheduled to give twelve addresses in Chicago. They want us to come to Bloomington and help stir up an improvement meeting. It is a good thing but we cannot understand why there are such a tremendous number of meetings held.

Besides this we are co-operating with the railroads in running educational trains over the state. We frequently speak to 1,600 people in a day, have one lecture in one car, another in the next and so on, stay about forty minutes and then move on. Some people think we are about like "Injun rubber" men, that we can stand anything. I was up until midnight last night, and traveled until 7:00 this morning. I am here now, then I go to Chicago, get a sleeper and go to business at 8:00 in the morning. You do not know how these men are working; that is not exceptional.

I have made a rule that I am trying to have enforced, that no man shall be up after 12:00, and not be up in the morning until 5:00. Some of our people are breaking down, and I will tell you why it is. Under this system we must run on a different basis.

I came to talk about reorganization. These are some of the things this College is doing. What are some of the phases connected with this situation, the College of Agriculture and the Experimental Station? The difference is this, the agricultural college is that portion that teaches agriculture to the students and to others, the experimental station is that part of the University that conducts experiments and publishes bulletins. They both attend meetings.

It so happens of these two, the college and the station, the experimental station is more public than the college that teaches students and attends to the business of instruction day by day; it is so much more public that of the money which Illinois is

willing to put up 29 per cent only goes to the college and 71 per cent in the experimental station. What does it mean? It means that the great bulk of the energy of the agricultural people must go to carrying on experiments, to the publishing of bulletins and to talk about new things, and very little can go to the taking care of the students who come there for instruction.

You have put so much more into experimental work and less into the college that we are compelled to leave classes untaught to meet your demands to go and do this other thing. Now the matter has gone so far that the college is being injured and I came tonight to show you just how and in what way you are killing the College of Agriculture in the University by making these demands and keeping support away from it.

Eight years ago we had 284 students in the College of Agriculture. At that time that seemed something large. At that time there was no College of Agriculture in the world that had a better faculty than we had. Today we have 750 students and we have less money than we had then for teaching purposes. Now if you can tell me how we can teach 750 students on less money than it took to teach 284, you will help me. I will tell you how it is done: it is done by cheapening the character of instruction. We have let some of our best men go to other states because we had to let them go. They could get more salary and we have hired cheaper and younger men to take their places because we could not do anything else. It has been going on for four years, this filling in by cheaper men doing the same work with the students. There was a time when many classes went without being taught or were taught by the students.

Two years ago what did the assembly of this State do to the College of Agriculture? It reduced its appropriation thirty-two thousand dollars below what it was at that time. That is the first time that any assembly ever reduced its appropriation to its State Agricultural College that I ever heard of. That is one point I want you to remember. The other point is this, that that same man who did that thing is the Chairman of the Ap-

appropriation Committee in the House again this year. A situation of that kind will bear watching.

What is the result of taking away from the College thirty-two thousand dollars? The result is we have cheapened instruction. We have withdrawn some courses. We have six vacancies and unless we can go on the same basis as other Colleges, this is what will happen: we will have to limit our students. There have been no new buildings in the last six years, but we have the largest and strongest experimental station in this country. You are putting more money in the experiment station than any other state except Nebraska, Iowa, Michigan, Missouri, Ohio and New York.

One-half of our funds for the College came from the Federal Government; Illinois never put a dollar in until eight years ago. It was started entirely by federal funds. Then you put in more money and have rested on your laurels ever since, so far as your College is concerned.

We have the greatest institution in the country. Now the time has come to talk plain; the people have forgotten the College of Agriculture. They are taking the money away year by year and last year they took thirty-two thousand dollars away at one time. The same man that did it is the Chairman of the Appropriation Committee again. I saw this thing coming two years ago and I knew perfectly well the College was in tremendous danger with vacancies; except where investigations are concerned it is weak.

We offer no course in rural sociology, although our churches are calling upon us to help with the country church problem. We have no men to send. We are doing nothing in poultry. We have no money to do it with. As long as this condition keeps on how are we going to meet the increasing student attendance? If the State will not put up the money we will have to keep the students away. Now seeing this condition approaching I thought it might as well go until it got pretty bad. This summer I put this up to leading farmers. The result was a committee of seven men were chosen to visit with me the neigh-

boring institutions and see how we compared. We have more money for investigation than any state in the union by considerable. We exceed Iowa, Nebraska, Minnesota, Wisconsin, Michigan and New York, but for the College of Agriculture we are behind. Let me tell you some of these facts. It was fun to see these farmers, every one happened to be a college man; it was fun to see each take his lesson in humility.

We have, all told, for our College of Agriculture, \$93,500; Cornell has \$237,000 a year for the College of Agriculture, to say nothing about the experimental station; this against our \$93,000, and we have more students than they have. How can we teach with \$93,000 as well as New York with less students and \$237,000.

In the matter of buildings, we have buildings on our campus that cost \$295,000; Iowa's buildings cost \$700,000 and New York's buildings cost \$997,000. Not only have the plans been approved by the state to be finished before 1920, calling for \$1,600,000 additional buildings, and when New York's buildings which have been approved are finished, they will have buildings for agricultural purposes amounting to over \$2,400,000 as against our \$295,000 worth of buildings. What are we going to do. How are we going to teach with such competition. Also see our neighboring university at Madison.

We have a judging room about half as large as this. We teach the breaking of colts, judge the cows, the beef cattle, the pure bred cattle, we judge sheep and swine. How are we going to do it in one room when our neighboring states have three judging rooms? Wisconsin has one that cost \$85,000 and ours is half of the lower floor of a wing that cost \$8,000. What are we going to do about it? They said at the last meeting of the Legislature, "That is extravagance and we will not stand for it." You must do what other states are doing or else not blame us for the consequences. This is what is being done, and it is my business to tell you and it is your business to decide as to what you wish. If it goes as it is much longer you will have no college of agriculture at all.

I have kept these facts until this year. There are men if they had known it would have left us long ago. They have had opportunities enough. Man after man has been offered five to eight hundred dollars additional salaries; they have stayed because they have faith in the state. We have men that would not be there if they had known the facts last year; but now we have to let it be known what the actual conditions are.

Another thing, it is well known, and it has been known for sixty days; if it had been known two years ago our faculty would have been raided by other institutions. We have shinned around by keeping our affairs to ourself. If you want a College of Agriculture you must get busy and get the money. It is a shame for this state that Wisconsin is putting up more money for her agricultural college than you are for yours. There is more desirable property in Cook county than there is in the whole State of Wisconsin. Michigan puts up more money than Illinois ever did. The time has come when we must get some money, and it is a question that is going into the millions.

The State of Minnesota will ask for an appropriation of \$1,600,000; that is something to think about. How are we going to get along with less than \$100,000 under these circumstances. I will tell you just as I said this summer, if that is what the people of Illinois want, I am through talking. It is not my fault. If you kill out a college and have only an experimental station left the young men will have to go to other states; that is the first thing that will happen. These things are not known to our student bodies. We are keeping up the best outside appearance we can, but this is the first thing that will happen. The Illinois men will go to other states to get what should be taught here.

We are preparing copy for a catalog and that will soon go to press. Some courses will be withdrawn because the state will not put up the money to teach nor put up the buildings to house them. This will go all over the country. It must come out this spring. Your boys will have to go to other states.

The next thing that will happen is this. This experiment

station is made up of men; they must be trained in the agricultural colleges. Experimental stations do not train men; they use them up. One of our troubles is to keep men in the experimental stations. No one but a young man can stand it; our men get tired of it. It is harder and harder to get young men to go into this work. The only place they can be trained is the college. Then you will have to import men from other states to man your own experimental station, to fill up your experimental station. That is the next thing. Now I know you do not want it that way.

You see what is going wrong; we are going mad after research work and experiments. I am a director as well as the president of the agricultural college. It is the college that does the teaching. It is the college that prepares the materials for the experimental subjects. Your experimental stations depend upon their being manned by trained men. I read a bulletin and said it looks like an experience instead of an experiment. That will not do for Illinois. What ought to be done, I will tell you, and you will agree with me. We have experimented with this thing long enough. We have found out by experience that the college cannot stand competition with the experimental work. What you as practical dairymen want is to have your questions answered. We want more money than has ever been put into the college. One man said, "Hang the students." We cannot hang these young fellows; we must have them. You must not forget the boys; I feel they are more worth saving than we are. Most of us were born too early, and the quicker we get out the better it will be for the boys. They will have a harder time than we have had, because these boys will have to do business with a population double what it is today. It is awful. Years before these young men are old men the population will be two hundred million people and there will be a whole lot of questions to answer. It is not fair for us to use all of the money to answer our questions and neglect these young people. This is what ought to be done: we must revise our definition of a College of Agriculture; we must mean by a College of Agriculture a whole faculty and

that faculty must be large enough and strong enough to do three things instead of one. Let us have a faculty that shall do three things: teach, carry on some research and carry on some extension work. Have every department organized under a three-legged process so this faculty is not dependent upon special legislation.

We have four men teaching agronomy, three men teaching husbandry; we have the same amount of teaching in all these departments; it is divided equally. When it comes to the experimental station, there are two funds for research work and two funds for special investigation that amount to \$75,000 a year. What have you on the dairy side? \$15,000. Let us have a faculty in agriculture as large as it ought to be. Let us have animal husbandry. Let us have dairying husbandry as large as it ought to be and so on down the line. Let us organize this faculty in agriculture in such a way as these subjects ought to be taught, pay for faculty, reorganize our college as a research and as an extension college should be, from one common fund. They do this in Wisconsin, and they do it in New York, but not in Illinois.

After that is organized, after that great faculty is organized, its salaries and equipment provided for, anything in special investigation may be done.

I want to say right here that the committee has made a report with a reorganization upon that plan. They are asking for about as much as New York has; it will help investigation quite independent of research work. It means a reorganization upon modern lines. It will mean a great deal of money. I want to tell you what the bill will call for; it will call for a million and a half dollars for agriculture in this state. This will enable us to have a College of Agriculture that will meet the demands. Unless we stop the students coming in we shall have more than twelve hundred students before any new building can be put up. In five years time we will have fifteen hundred. The men are flocking into the colleges to get instruction; they are coming from the towns and from the large cities. There are more from Cook county than any other county. They are coming from all over

the state. I am telling you this in a general way. Illinois has been unwilling to increase its agricultural fund one bit, but has reduced it. The money goes to the experimental station, but it does not help the students any. In a little while this policy would destroy the college.

I have tried to make a plain statement of the situation, and would be glad to answer any questions I could answer. I want to attract your attention, and your interest as a teaching institution as well as one that makes experiments and publishes results.

I want to say just one word about what agriculture is coming to mean these days. There is no subject that stands better in the estimation of our people than agriculture. There used to be a time when the agricultural students were laughed at. That time is past. No one need to hesitate to come to the University of Illinois, either on an excursion or to attend this two weeks' course or at any other time with the understanding that he will not be welcome at the university.

I saw a man the other day, an old man, coming up the street with his grip. I stepped up to him and said, "You are looking for some one." He was coming to the university. He had his nose pointed toward an agricultural building; it is not only our agricultural faculty, but the Y. M. C. A. has organized office rooms for these men and boys and helps to make it pleasant for them. Our Agricultural Club takes the case in hand during these two weeks and helps to make it pleasant. The people say it is a mighty strong body of men that come here. The professor in Greek said: "I like the looks of the fellows that come at this time." I want to advertise this class; we want more people.

Let me tell you what we did a few years ago when we planned the agricultural building; we planned two acres of floor space and we had nineteen students. Every one said, "You are crazy." It did look that way. That was twelve years ago and it was ten years ago when we went into it. We have changed this plan; two departments are moved out and we are as thick as sardines in a box. We do not dare advertise. We started with nineteen students, now we have 750. It simply means these two things

have happened: that men, both old and young men, men and women, have found out that about the biggest thing in this country is its agriculture; the best place to be is on the land, that is the first thing. It would surprise you the extent to which the people in the cities are turning their eyes toward the land. It commenced about four years ago. The second thing is this, that young men are beginning to find that agriculture is a science as well as an art. Now science must be learned at college. The art of agriculture does not develop itself. How many years and years have farmers cultivated clover without finding out those little nodules that are there; a man in Europe discovered that.

A student comes to the college to learn the reason, the why, and not the how; you get that in practice. You come to learn how to become skillful in the Babcock test. You want to learn the cheapest sources of feed; how to put it on the market in the right way. Learn to get information quickly. The department in agriculture will have information at its fingers' ends that they have in Italy, Sweden or any other country and you never know how valuable a little bit of information is.

Let me tell you what I learned today. I had not seen Mr. Haliburt for a number of months, but you know that one of the most important suits at law is on now in Chicago having to do with the water rights of a private company in the Desplaines river. This question turned upon a historic point and only three men know about it. Now for instance you want to know a certain thing in Elgin and there are not more than six men who know it. It is the business of the College of Agriculture to find out these things.

If you build up a strong faculty you will make a large institution, but if you do not you will be in the same shape so many of the churches are in now. The churches are asking us to answer the question why is it that the country churches are going down; why? We cannot say a single word because we have no money to hire the man that could do that thing. We saw it coming three or four years ago, but we had no money. If you are going to do this thing in a business like way we must have a man to take care of it.

You may hear that there is a large bill introduced into the Legislature this winter; you may hear that the folks at the university are going crazy. We have seven of the most intelligent farmers take this thing up; they visited our college and others for over two weeks to acquaint themselves with what was being done. Those were busy men that gave up their time to look into this matter.

Member: How much do you need for new buildings?

Dean Davenport: We need a hundred thousand dollars for new buildings; we need buildings where horses can be trained, where herds can be brought. We need 287 thousand dollars a year for salaries and equipment and maintenance of the faculty of the College of Agriculture. In a short time this committee will have reported and you can get all information by writing to either Mr. Frank Mann, chairman, Mr. Rudd, secretary, or by writing to me. These bulletins will be for distribution. We are anxious for every farmer to know the situation. We will have just as good a college as you make it. Write me letters and ask me any questions you want to know. Come down and see us and see what the state is doing. We are a faculty made up of people who have been invited to come there. There is not a man there who was not asked to come there. No man applies for a position except some of the younger men. Remember this, that in the College of Agriculture every man who holds a position is a man who has been asked to come there and take that position, except some young men in assistant positions.

We have tried hard for a year to get a man in municipal and sanitary dairying; we tried to fill Truman's position; we gave him \$2,000, and we have had it turned down three times at \$3,000. It is going to take money to get men of this kind. The average salary is \$1,934. Center was elected to fill a position at \$3,000; we had been paying him \$2,000. We cannot keep men for \$2,000; we must have a few five and six thousand dollar men; this thing is coming. You have got to pay a man if you are going to get expert knowledge. While I am on this

point I want to say this: do not think we are trying to have our salaries raised. I am trying to run that college as cheap as I can. When we lose a man what kind of a man are we going to get in his place; as good a man, or a poorer man? That is the question. We lost Center the other day. With what kind of a man shall we fill his place? Shall we fill it with a thousand dollar man? That will not make a strong college. We do not value the opinion of a thousand dollar man. Neither do you want to send your boys away for four years to take instruction of a thousand dollar man. You want a man who knows the subjects and who is personally acquainted with them.

I met a man today who said: "I know personally every man in the world that is a historian in my field." I can say that I know personally or by correspondence every man who is working along my line; that makes my instruction worth more than if I could not say that. If you are going to have that kind of men you must pay them more than the teacher's salary, because that contact with people, the knowing of people the world over costs money and it takes time.

We have had a long talk; I have talked too long. I want to say that when we lose a man to another institution we shall have to fill his place with a better man. I will never try to hold a man if he wants to go. When a man comes to me and says he wants to leave, it is better for him to go. If any man gets it in his mind that he wants to go, he ought to go. One of our leading men came to me a few days ago and said he was going to leave us. All I could say was, "If you feel that is what you ought to do, then you ought to go." These are the things that will take the heart out of the largest departments. We have never offered a man more money in order to hold him.

Just one more remark. The University of Harvard has sixty men with a salary of five thousand dollars or more. That is the kind of men that make a great institution. Will you have a first, second, third, fourth, fifth or sixth class university. Gentlemen, I thank you.

Mr. Newman: I want to call your attention to the meeting tomorrow morning. Dr. Peters, who will have charge of the experimental work tomorrow morning, I know you will enjoy listening to him. He is the gentleman we got from Nebraska. He stands very high in his work and will talk and lecture to you tomorrow morning on the "Diseases of the Udder." I hope there will be a large attendance.

The meeting will now stand adjourned for tonight.



NEEDS OF COLLEGE OF AGRICULTURE.

Report of Agricultural Committee.

This committee may be said to represent the following organizations :

The Illinois Live Stock Breeders' Association,
The Illinois Grain Dealers' Association,
The Illinois Corn Growers' Association,
The Illinois State Farmers' Institute,
The Illinois Horticultural Society,
The Illinois Dairymen's Association,
The Illinois State Florists' Association,

besides miscellaneous unorganized agricultural interests.

How the Committee Came Into Existence.

Appropriations made by the State of Illinois for the conducting of experimental work in agriculture at the Experiment Station, in connection with the College of Agriculture at Urbana, have carried with them the provision that such funds should be expended under the supervision of an Advisory Committee of five members in each case, which committees are appointed respectively by the various state organizations interested in the lines of work in which experiments are to be made.

Following out this provision

The Illinois Grain Dealers' Association and the Illinois Corn Growers' Association, jointly, appoint the Advisory Committee on Crops,
The Illinois Live Stock Breeders' Association, the Committee on Animal Husbandry,
The Illinois State Farmers' Institute, the Committee on Soils,
The Illinois Horticultural Society, the Committee on Orchards,
The Illinois Dairymen's Association, the Committee on Dairying,
The Illinois State Florists' Association, the Committee on Floriculture.

Thus have come into existence six committees of five members each, having a general supervision over the experimental work in agriculture. These committees meet separately as the interests of their individual departments require, and general meetings of all are held at least once a year. It is fair to assume that each committee is composed of representative men of the state in that particular branch of agriculture covered. It is also fair to assume that these thirty men, acting jointly, represent in the broadest possible way the agricultural interests of the state.

At a general called meeting of these committees held at Urbana on August 16, 1910, the condition of the Agricultural College was taken under consideration. Such short investigation as could be made at the time convinced those present that a thorough investigation was needed, and by unanimous vote a committee was constituted to arrange for a general investigation. Mr. F. I. Mann, of Gilman, Illinois, was made chairman and all members of the Advisory Committees were named as members, as well as the various officers of the before mentioned agricultural associations. In addition to this, prominent men interested throughout the state were added to the committee.

On October 17 this committee, which was called the General Agricultural Committee, met, pursuant to written notice, at the Agricultural College at Urbana. As a result of its deliberations, the following conclusions were arrived at:

First: That conditions were most critical and the existence of the Agricultural College as a school of the first rank was at stake.

Second: Any practical solution of the problem and the drawing of conclusions which could be sustained before the people of the state, would require extended and careful investigation which could not be carried out by a large body of men.

Third: That a small committee must be selected which should consist of representative men who would be able and willing to give the necessary time to a thorough and exhaustive investigation, and that such investigation would necessarily require an investigation of the institutions in the neighboring states

and a knowledge of the work done and the work planned in those institutions.

Thereupon the following committee was appointed to undertake on behalf of the General Committee the investigation specified:

F. I. Mann, Chairman, Gilman, Illinois; Auditor of the State Farmers' Institute.

Ralph Allen, Delavan, Illinois; Director of the State Farmers' Institute.

H. J. Sconce, Sidell, Illinois; Corn Breeder and Grower.

C. A. Ewing, Decatur, Illinois; Attorney-at-Law and farmer in a large way.

W. N. Rudd, Blue Island, Illinois; President of Mount Greenwood Cemetery Association, Chicago, and identified with the ornamental branches of horticulture.

Upon the fact of the appointment of this committee becoming known to the Trustees of the University of Illinois, they delegated two of their members, Mr. A. P. Grout, of Winchester, Illinois, and Mr. F. L. Hatch, of Spring Grove, Illinois, together with Eugene Davenport, Dean of the Agricultural College, to accompany the committee in their tour of inspection. Upon the completion of the inspection of other institutions, and after a subsequent thorough investigation of the College of Agriculture of the State of Illinois, a meeting of the General Agricultural Committee was again called, which was held at Urbana on December 8 and 9.

At this meeting the report of the Sub-Committee was presented and unanimously approved. The Sub-Committee was continued and made a permanent committee by unanimous vote, with instructions to make public the findings in the report, and to promote in every possible legitimate way the strengthening of the Agricultural College of the University of Illinois in accordance with the terms of the report so accepted.

The Work of the Committee.

The committee at its first meeting decided that a knowledge of conditions in similar institutions in other states, as had been

pointed out by the General Committee, was absolutely necessary; and that a proper investigation of other institutions required a knowledge of the scope of our own College, of the conditions now existing and, in a general way, of the demands made by the people of the state. A preliminary investigation of conditions at Urbana was undertaken by each member individually presumably in the line of supplying his own individual requirements.

October 27, the committee, together with Dean Davenport and the two members of the Board of Trustees, left Chicago for Ames, Iowa, examining the Iowa College of Agriculture at that place; thence going to Lincoln, Nebraska, for an investigation of the Nebraska State College of Agriculture; thence to Minneapolis and the Minnesota College; then to Madison, Wisconsin, and the State Agricultural College of Wisconsin. Later a second trip was taken including the Michigan Agricultural College at Lansing, Michigan; the Agricultural College of the State of New York, connected with Cornell University, Ithaca, New York; the New York State Experiment Station at Geneva, New York; and ending with the Ohio Agricultural College at Columbus, Ohio. The entire committee, as well as the two Trustees and Dean Davenport made the two trips with the exception of Trustee Grout, who was unable to make the visit to Lansing, Michigan, but covered all the rest of the trip.

After the return from the tour of inspection the committee met at Urbana and was in session almost continuously, days and evenings, for six days. Its work at Urbana consisted in a careful examination of the buildings, the equipment, and the scope of instruction, and a comparison with other institutions in the light of information acquired during the trip. The committee made it a special point to closely question the leading men in other institutions as to their own work, and also the weak parts of their organization, and the information thus gained was of much value when applied to the investigation of our own conditions. The chief of each department of the Agricultural College at Urbana was examined at length as to the needs of his department, and as to the conditions existing. The Dean of the Col-

lege was called upon to corroborate or modify the opinions of his assistants. All facts were weighed, statements were sifted, differing local conditions between Illinois and other states were considered, and the committee used its best judgment to separate and discard all fads and theoretical fancies. It had in view, first, efficiency, and, hardly second, almost equally economy. In other words, its attempt was to make such recommendations as would secure for the people of Illinois in its College of Agriculture, a great, strong, economically and practically organized public service institution which should work to the betterment of the whole people of our commonwealth.

The Findings of the Committee.

Having been so courteously received at every institution visited, and so freely and so fully advised as to the details of organization and management in each case, it would have been highly improper to make specific statements or criticisms. It may suffice to say in general that the committee found much to commend and much to recommend for adoption in our own College. It also found some things to criticize, notably in some institutions what appeared to the committee to be extravagant expenditure for buildings and for equipment. It found that the best work was not in all cases being done where expensive buildings and expensive equipment existed. On the other hand it found in other institutions where the buildings and equipment were inadequate, that the work of a good corps of men was not so effective as it should be. Its findings are based on the necessity for a high grade staff, reasonably good equipment which will permit of obtaining the best results of which the staff is capable, and of a sufficient number of plain, well built, substantial, but not high priced buildings to house the equipment and to furnish room for properly and economically giving the instruction and research demanded.



Guernsey—Icydale (University of Illinois.)

	Lbs. Milk.	Lbs. Fat.
Lactation period, 350 days	7493	392
Lactation period, 320 days	6915	344
Lactation period, 240 days	6091	317
Lactation period, 335 days	8015	387

Specific Recommendations.

A careful scrutiny of present lines in which instruction was given and a study of the records of attendance, made it evident that none of the present lines could properly be discontinued. The committee also became convinced that the items included in the report under "New and Enlarged Lines of Work" were essential. It should be understood that not all of these lines are new, but that a part of them have been worked out in a small way and that the progress of agriculture and general science, and the demand from the people of Illinois requires their enlargement along lines specified.

Classes of People in the State Benefited by the Agricultural College.

It was understood by the committee that it might be claimed that an enlargement and strengthening of the Agricultural College was class legislation, and was singling out the farmer for benefits denied the other citizens of the state. Secretary Wilson of the Department of Agriculture has stated that eighty-five per cent of all the materials used in manufactures, are agricultural products. All of the railroads in the State of Illinois are dependent for a large proportion of their earnings upon the transportation of the farmers' purchases from the cities. Every citizen of the state is dependent upon the farms for his food supply, and every move which increases the productiveness of the farm tends to increase the abundance of his food supply and decrease the cost of the same. In times of large crops the state is prosperous; in times of short crops the reverse is the case. It should be borne in mind that while trade and commerce do not increase the aggregate wealth of the country, but simply transfer it from one point to another, the farmer is a producer and that every per cent by which his crop is increased is so much added to the wealth of the state, and is, therefore, of an advantage to every other citizen in the state.

However, while in certain of the new and enlarged departments of the college the activities will be directed specifically to

the betterment of the farmer, many of them apply equally to every citizen in the state. Municipal and sanitary dairying, while incidentally benefiting the producer of milk, have for their object the purifying and rendering safe the milk supply of the state, and thus affect to a many times greater degree the inhabitants of the cities. Landscape Gardening, which has for its primary object the embellishment and adornment of the home grounds, affects each citizen equally. The same applies to Floriculture. The raising of poultry is becoming more and more a work carried on in the suburbs and outskirts of the cities. The conservation and increase of the forest areas, and the timbering of lands which are now waste touches all citizens both by the increase of resources and by the influence upon the water supply. Household organization and activities and household sanitation and health, are subjects which apply alike to every household in the state. The work of the College, therefore, both in a broad way, as has been shown, and in many specific ways, applies to all citizens of the state and cannot be regarded as favoring one class at the expense of another.

It is a fair assumption that in the extent of money invested in agriculture and in the bulk of its agricultural products, Illinois leads all the states of the Union. The committee has given weight to this fact and yet has not attempted to create a competition in expenditures for agricultural education, or to recommend that our state make expenditures in proportion to those made in certain lines by states of lesser importance, but it has attempted to find out what is really needed and to recommend such expenditures as will enable the College of Agriculture of Illinois to meet the proper demands of the citizens of Illinois.

For the Committee,

W. N. Rudd.

GENERAL AGRICULTURAL COMMITTEE.

Report of Sub-Committee.

We, your committee appointed to visit the various Agricultural Colleges and to make comparative investigations of conditions existing, beg leave to submit the following report:

At our first meeting to give general consideration to the matter placed in our hands, it became evident that a close survey of the work in other states must be made.

We, therefore, have visited the following institutions:

Iowa State College of Agriculture, Ames, Iowa.

Nebraska State College of Agriculture, Lincoln, Neb.

Minnesota State College of Agriculture, Minneapolis, Minn.

Wisconsin State College of Agriculture, Madison, Wis.

Michigan Agricultural College, Lansing, Mich.

New York College of Agriculture—Cornell University, Ithaca.

New York State Experiment Station, Geneva, N. Y.

Ohio State College of Agriculture, Columbus, O.

The above list of institutions was selected to be visited as being considered typical of the various ideas and methods of instruction and research which might be of most use in considering our Illinois problem.

At each institution visited an attempt was made, so far as the time at our disposal permitted, first to make a general survey of the buildings, equipment and financial resources, and of the relative emphasis given the three different branches which must necessarily be embraced in the activities of all such institutions which properly fulfill their functions, namely, Teaching, Research and Extension (that is the carrying to the people and the putting in practical operation the results gathered through research and experimentation); second, to ascertain further, by discussion with the leading men of the institution visited, their general policies, separating those arising through local conditions from those of wider application. In every case we were shown

the greatest courtesy and afforded every facility for obtaining the information desired.

At all institutions visited the prominent fact was the phenomenal awakening of public interest in things agricultural, the rapidly increasing number of students and the new lines of work everywhere demanded.

At each institution was emphasized the necessity of a better and better class of men for teaching and research, and the growing difficulty of obtaining and retaining them. Our unanimous conclusion is that of the three branches of work mentioned before, teaching does and must stand first. Scarcely second in importance, and essential to the best teaching, is research; while without well planned extension work, much of the results and practical application of research does not promptly reach the people for whom it is intended. In no case must extension work be allowed to infringe on the other branches, as such a course will not only decrease the effectiveness in those branches, but ultimately lower the standard of the extension work itself.

The above is formulated, not with the idea that the College of Agriculture of the University of Illinois is solely a teaching institution, or that it exists for research, or that its province is the dissemination of popular knowledge; but that it is, and ever must be, a great public service organization for the betterment of agriculture in its broadest sense and of the people engaged directly or indirectly in agricultural pursuits.

We have given especial attention to the subject of Domestic or Household Science, and our specific recommendations, to follow, have in view a radical departure in broadening and extending the scope of that most important department.

After returning from our investigation of the institutions in other states we have made a careful investigation of conditions in Illinois. We feel warranted in stating that the people of our state may take just pride in their Agricultural College, in its personnel, and in the work which it has done under difficulties generally unknown, but we must not be blinded to the fact that we now face the greatest crisis in its history.

Seven years ago the College had 339 students. During

these seven years, it is fair to say that the scope of agricultural education has doubled, the directions in which instruction and research are demanded has more than doubled, and the students enrolled number nearly two and one-third times those of seven years since; while the funds and facilities available are practically the same as those of 1903-04. In this connection attention is called to the following table, a careful study of which is invited:

Growth and Funds of College and Station, University of Illinois.

Year	Federal College	Funds Station	State College	Appropriation Station	Students Registered	Graduating Class	Graduate Students
90-91	\$ 5,000	\$15,000			7	2	0
91-92	 5,000	15,000			6	0	2
92-93	 5,000	15,000			13	2	0
93-94	 5,000	15,000			5	1	2
94-95	 5,000	15,000			9	0	0
95-96	 7,000	15,000			14	0	0
96-97	 7,000	15,000			17	2	0
97-98	 7,000	15,000			19	2	0
98-99	 7,000	15,000			25	4	0
99-00	 28,000	15,000			90	2	0
00-01	 28,000	15,000			159	4	0
01-02	 28,000	15,000	\$ 8,000	\$ 54,000	232	4	0
02-03	 28,000	15,000	8,000	54,000	284	9	0
03-04	 28,000	15,000	61,000	85,000	339	10	0
04-05	 28,000	15,000	61,000	85,000	406	18	0
05-06	 28,500	20,000	61,000	95,000	430	24	9
06-07	 28,500	22,000	61,000	95,000	462	43	10
07-08	 31,000	24,000	71,000	102,500	528	38	17
08-09	 33,500	26,000	71,000	102,500	531	54	15
09-10	 36,000	28,000	55,000	138,000	660	49	23
10-11	 38,500	30,000	55,000	138,000	662*	?	31*

*Will be at least 750, all told, before the year closes, besides 50 in the Academy.

The average annual rate of increase in the number of students for the past ten years has been over 17%. On this basis, in two years (and before all buildings recommended can be completed) there will be over 1,000 students, and in five years there will be nearly 1,700.

If the people of Illinois are to be effectively served as they have been in the past, immediate provision for not only present essentials, but for reasonable requirements in the near future must be made; otherwise our college will sink into the position of a second rate school, and our students seeking education must go to other states.

Other colleges and private commercial interests are making such inroads on our present efficient corps of men that additional funds must be made available in order to maintain the present efficiency. Additional instructors must be provided to care for the more than doubled number of students and for the new lines of instruction demanded. More men must be had for research. The demand for extension work from almost every township in the state must be met by an additional force. New buildings and new equipment must be provided. The establishment of agricultural instruction in the public and normal schools of the state and the training of teachers in these subjects should be pushed as rapidly as possible.

Passing every demand in review, and subjecting every item to the closest scrutiny with a view to strict economy, we submit the following recommendations, being convinced that none may be omitted or reduced in amount without serious damage to the interests at stake.

New and Enlarged Lines of Work and Cost of Maintenance.

	Now.	Prospective.
Soil Biology	\$ 6,000	\$ 10,000
Municipal and Sanitary Dairying	5,000	10,000
Veterinary Science	3,000	10,000
Farm Organization and Management	10,000	25,000
Rural Sociology	6,000	8,000
Agricultural Education	10,000	10,000
Landscape Gardening	10,000	10,000
Floriculture	7,000	10,000
Rural Architecture	7,000	7,000
Poultry	10,000	10,000
Forestry	10,000	25,000
Comparative Agriculture		5,000
Genetics	3,000	10,000
Animal Nutrition	10,000	25,000
Household Organization and Activities,		
Household Sanitation and Health.....	6,000	6,000
Agricultural Extension	15,000	15,000
Farm Mechanics	10,000	20,000
Total	\$128,000	\$216,000

Total amount immediately required as above.....	\$128,000
Less amount covered under former appropriation....	32,000
Net annual amount immediately required for new and enlarged lines of work	\$ 96,000
Prospective amount for new and enlarged lines as above	\$216,00
Less amount immediately required	\$128,000
Net amount by which the immediate annual requirements must be increased in the near future	\$ 88,000

Buildings.

Repair Fund, 5 per cent of \$295,000 invested in buildings	\$ 14,750
Addition to Agonomy Greenhouse	9,000
Plant Breeding House	8,000
Present Glass Houses rebuilt and enlarged	35,000
To complete Horticultural and Field Laboratory.....	9,000
Addition to Agricultural Building, 100,000 sq. ft.	337,500
Dairy Cattle Building	40,000
Dairy Investigating Barn	12,000
Horse Building	40,000
Sheep Buildings	15,000
Judging Pavilion	100,000
Tool Barn on South Farm	2,000
Clinic Building	5,000
Alteration Farm Mechanics Building	8,000

Total amount for buildings which must be built at once\$635,250

Considering the fact that Household science has twice outgrown its quarters, and that the present rooms are entirely inadequate for serving more than the present enrollment of 225, and considering the growing importance of a serious study of the home as an economic and social institution, the Committee recommends that at the next biennium succeeding the coming ses-

sion, appropriations should be made for a building sufficiently commodious to provide for the adequate study of the affairs of the home whether by women or by men, and that such a building fully equipped should cost not less than \$200,000.

Equipment.

Dairy Cattle	\$ 8,000
Beef Cattle	8,000
Horses	12,000
Sheep	2,000
Swine	2,000
	\$ 32,000
Farm Machinery	3,500
Total new equipment immediately required.....	\$ 35,500

Maintenance (Annually).

Agronomy	\$10,400
Animal Husbandry	20,000
Dairy Husbandry	20,500
Horticulture	21,300
Veterinary Science	2,000
Household Science	5,000
College Extension	9,000
General Offices	7,000
	\$ 96,100

Salaries.

Total present salary of the teaching faculty.....	\$ 95,000
Vacancies and cost of filling	8,600
Increase necessary to maintain a body of first class men	15,000
Additional assistance because of increased number of students	16,400

Total amount required annually for salaries to continue the teaching work in its present scope..\$135,000

Summary.

Amounts required to supply the Urgent Needs of the Agricultural College of the State of Illinois:

Annual Appropriations.

Salaries	\$135,000
Maintenance	96,100
New lines of work	96,000
	\$327,100

Deduct Federal appropriation	\$ 40,000
Total Annual Appropriations by the State.....	\$287,100

Appropriations To Be Made But Once.

New Equipment	\$ 35,500
Buildings	635,250
Total	\$670,750
Total appropriations to be made for the coming bi-ennium	\$1,244,950

The Committee early decided that in view of the rapidly increasing number of students anything like temporary methods were not only inadequate and futile but were bound to result in a waste of money. Accordingly, the purpose has been to look ahead as far as may be in order that the recommendations may become a part of a comprehensive plan, and in several instances recommendations are divided between what must be provided at once on account of the life of the institution and those needs that are clearly coming in the future. The above may probably be made to cover the requirements for a period of five years.

We believe it should be the policy of the college to take part in public exhibitions of an educational nature, but are firmly convinced that the established policy of not entering into competitive exhibitions should be commended and continued.

The attention of fairs and expositions especially is called to the fact that the work of the college and station affords much

excellent material for attractive exhibits, but that such exhibitions should be strictly educational and not competitive; first, because such institutions are established as educational agencies; second, because no basis for competition exists between educational exhibits; and third, because the support is all derived from public funds. The Committee has included no estimates thereof for defraying its expenses of competitive exhibits.

The following table gives in comparative form as furnished to us, the most important facts regarding the other institutions visited:

How the Illinois College of Agriculture Compares With Its Neighbors.

	College Funds	Station Funds	Number T'chr's	Stu- dents 1909-10	Stu- dents 1910	Value of Buildings	Value of Live Stock
Ill.	\$ 93,500	\$168,000	49	683	691a	\$295,000	\$14,500
Iowa	125,000	70,000	68		703b	700,000c	50,000
Neb.	105,000	65,000	41		225d	233,000e	27,000
Minn.....	157,000f		66		400g	620,000h	24,600
Wis.	\$265,000		46	381	565	507,000	26,000
Mich.	285,000i	28,000	104i	479		268,000	24,000
N. Y.j	237,500	137,000	100	533	676	997,000k	
Ohio		166,000	30	475	526	230,000	25,000
Mo.l	100,000	70,000	45	352		242,500	25,000

a—Not including 50 in the Academy, 100 above last year at the same date. 15 from foreign countries; 68 from other states.

b—Of these, 137 in Domestic Science. Also 144 two-year students.

c—Iowa Ag. Bldg. \$370,000; is to build new building \$150,000.

d—Not including 390 in the elementary school.

e—Stated that immediate needs are for \$525,000 additional.

f—Does not include buildings or repairs.

g—One-half women, largely teachers. Also 800 in Elementary school of Agriculture.

h—New buildings amounting to \$300,000 provided for and will ask for a total appropriation of \$1,600,000.

i—Not comparable as this includes non-technical teaching.

j—Strictly comparable with Illinois. Includes College at Ithaca and station at Geneva, but does not include three Schools of Agriculture, nor \$45,000 for State Veterinary College. Asking now for \$300,000 for the College.

k—\$1,602,000 yet to come under the plan adopted, not including Veterinary College \$130,000.

l—The only institution not visited but included as it is in the class with Illinois.

It should be noted that the amount recommended herein to be appropriated for new buildings at the Illinois College of Agriculture is less than 40 per cent of that provided for in New York and when the buildings planned in both states are completed, New York will have \$2.75 invested in buildings against \$1.00 in Illinois, although her agricultural interests do not even approximate those of Illinois in extent.

While not technically a part of the College, the work of the State Entomologist is so closely related and of such great importance to all departments of agriculture that we wish to bespeak most careful consideration of his requirements. We recommend the appropriation of \$38,000 asked by him for this work.

Respectfully submitted,

F. I. MANN, Gilman, Ill., Chairman.

RALPH ALLEN, Delevan, Ill.

C. A. Ewing, Decatur, Ill.

H. J. SCONCE, Sidell, Ill.

W. N. RUPP, Blue Island, Ill.

On December 5 a meeting of the General Agricultural Committee was duly called and held at Urbana, at which meeting there were present representatives of the various advisory committees, agricultural associations and leading representatives

of agriculture. At this meeting the following actions were taken:

The above report was read and approved.

A legislative committee was provided for, which is to be composed of the special committee as above named, to which was added one member from each advisory committee, as follows: J. P. Mason, J. Mack Tanner, Joseph R. Fulkerson.



Wednesday Morning, January 18, 1911.

President: The meeting will come to order. Dairymen who are interested in the milk testing and butter judging can step to the second floor where the work is going on now.

Dr. Peters, who is scheduled for this morning telegraphed his train was three hours late. We have waited some little time but are fortunate in having Mr. Glover with us who will talk to us this morning and Dr. Peters will speak to us this afternoon.

The Illinois Dairymen's reports are here on the platform; if any of you desire them when the meeting is over, come forward and get what you want. Those who have not secured their membership badges, or who have not put their names on the roll can stop at the Secretary's office and secure their badges.

The meeting must start promptly this afternoon as we have quite a full program.

I can hardly say anything new to you about Mr. Glover; you all know him. He has worked in the Elgin district for a great many years. It is a great pleasure to have him with us this morning. I will ask Mr. Glover to come here and talk to us. Gentlemen, Mr. Glover.

THE RELATION OF THE DAIRY COW TO FERTILITY.

ByBy A. J. Glover, Associate Editor Hoard's Dairyman, Ft. Atkinson, Wis.

Mr. Chairman, Ladies and Gentlemen:—It is like coming home for me to visit Elgin. It was my good fortune to live in this city for three years and to labor with the dairymen of the State of Illinois for nearly four years.

I have often wondered if I did not learn more from you than you did from me. It is not necessary for me to say that I came here for the purpose of determining the relative value of the cow and to get the dairymen to understand the importance of knowing the ability of each cow in their herds. In my investigations I found good cows, fair cows, poor cows and cows that were worse than worthless. But I did not come here to talk to you about the kind of cows to keep, but their relation to fertility of the soil.

I cannot tell you the feeling I experienced when I first went to the agricultural college and was told that plants feed much the same as animals do; that in the production of a hundred bushels of corn, a definite amount of food is required. It had never occurred to me that cropping the land year after year would in time exhaust the fertility of the land, and if continued long enough would make the soil unproductive. As I advanced in the study of agricultural problems I found that the different systems of farming required different methods of soil treatment; that grain farming took more fertility out of the soil than live stock raising; that the dairy cow was the easiest upon the fertility of the soil; that she made the rotation of crops possible and that she consumed considerable forage that has no market value without her.

I want to take up the elements of plant food and do not want to weary you but I want to talk in as practical a way as possible.

There are ten important elements of plant food we must

have in the soil before we can grow a crop, and if the soil lacks in any one of these elements nothing will grow. These elements are: Oxygen, carbon, hydrogen, nitrogen, phosphorus, potassium, iron, calcium, magnesium and sulphur. Iron for example, is an essential element but there is enough iron in Illinois soil to last thousands of years. But without iron in the soil no plants will grow. It is the chlorophyll that makes the plant green, and without iron, chlorophyll cannot be made. I might go on mentioning other seemingly unimportant elements of plant food, but I think it better for me to confine my remarks to the three most important elements or those which must concern the farmer, namely, nitrogen, phosphorus and potassium. These words may seem hard to some of you who have not heard them before. My only reply is, if they seem unreasonable why don't we have them taught in our public schools, they are no more difficult to learn than scores of the terms we learn in arithmetic and never use outside the school house. For example, the least common multiple, greatest common divisor, etc. I will leave it to you what words are the most important for the farmers' sons to know.

I will consider briefly the elements, nitrogen, phosphorus and potassium.

Nitrogen forms about four-fifths of the air or about 12 pounds is resting upon every square inch of soil. Since it is one of the necessary elements of plant food which must be considered by the farmer, the question is, how can it be incorporated into the soil in sufficient amounts for growing crops? It has been found by scientists that the legume family of plants have bacteria growing upon their roots which form nodules and gather nitrogen from the air. In a practical way the farmer has discovered that the growing of clover enriches his land, that is, if properly handled. In brief one may say that the nitrogen supply of the soil may be kept up through growing clover, alfalfa, etc.

Phosphorus is lacking, on the whole, in Illinois soils. The only way to get phosphorus into the soil is to purchase it and

one of the cheapest forms is finely ground rock phosphate. For quick returns treated rock or steamed bone meal is the best to use, for the phosphate in the raw rock does not become available to plants until it becomes associated with decomposing organic matter. It is a good plan to mix 40 or 50 pounds of raw rock phosphate to each load of manure before applying it to the land.

Potassium is found in abundance in the soils of Illinois, and does not need much consideration at present, except for peaty lands. I shall therefore not dwell upon this element but shall consider it when discussing the elements of fertility removed in the production of milk.

In the making of milk the soil is required to give up some of its fertility. The crops grown for our live stock take from the soil some of the elements which are necessary for the making of milk. Through the work of investigators it has become possible to determine quite accurately just how much fertility is required to produce a definite amount of milk. The chemist has analyzed the different feed stuffs and found that they are made up of different amounts of elements which have come from the soil and air. Milk has been analyzed and found to contain some of the elements that are found in the soil. In order to present a concrete example, it becomes necessary to assume the amount of feed a good cow will consume in a year and the amount of milk she will produce. No dairyman should be satisfied to keep a cow unless she produces 7,000 or 8,000 pounds of milk throughout the year, testing at least 3.8 per cent. A ration consisting of 30 pounds silage, 10 pounds clover hay, 5 pounds corn stover, 4 pounds corn chop, 3 pounds bran and 1 pound oil meal will supply ample nutrients for a cow to produce 8,000 pounds of 3.8 per cent milk in a year.

During the first part of the animal's lactation period, or when she is giving the largest flow of milk, it will require more grain than I have allowed for this period, but during the resting period, which will be from 6 to 8 weeks, she will not require very much, if any, grain if she has all the silage and clover hay

she will consume. For the purpose of illustrating what I wish to bring out, I have not permitted the cow any pasture, but have fed her prepared feeds and it is fair to say that the amount of feed she would need in a year would be about 6 tons of silage, 2 tons of clover hay, 1,000 pounds of corn stover, 1,500 pounds of corn chop, 1,000 pounds of bran and 300 pounds of oil meal. It is common knowledge that a certain amount of fertility has been taken from the soil to produce these feeds and that the soil does not contain an unlimited supply of some of these elements.

Dr. Hopkins of the University of Illinois, the best soil authority in the country, says that most Illinois soils lack in phosphorus and nitrogen, but that they are well supplied with all the other elements. It is generally held that there are three important elements of plant food, namely, nitrogen, phosphorus and potash. It will be interesting, I am sure, to know just how much of these elements is required to produce the amount of feed that I have assumed the cow would eat in producing 8,000 pounds of milk testing 3.8 per cent and maintaining her body. It is not difficult now to obtain tables showing the amount of fertilizing elements in 1,000 pounds of the different feed stuffs and so I have calculated to give in the following table the amount of nitrogen, phosphorus and potash taken from the soil to produce the feed which a cow will consume in a year. The following table shows the different amounts of elements in the different amounts of feeds:

Name and Amt. of Feed.	Lbs. Nitrogen.	Lbs. Phosphorus.	Lbs. Potash
6 tons corn silage.....	52	13	44
2 tons clover hay	80	22	75
1,000 lbs. corn stover	6	4	11
1,500 lbs. corn chop	24	10	8
1,000 lbs. bran	25	27	15
300 lbs. oil meal	20	6	4
Total	207	82	157

In other words, the soil must give up 207 pounds nitrogen, 82 pounds phosphorus and 157 pounds potash to produce feed enough to sustain an animal making 8,000 pounds of 3.8 per cent milk a year. Part of these elements is used for the maintenance of the animal, some for the making of milk and the rest is returned to the soil in the form of manure. For practical purposes, it is safe to say that 25 per cent of the elements is used in the manufacture of milk and the other 75 per cent is used by the animal and returned in the manure. Upon this basis we may make the following table:

	Lbs.	Lbs.	Lbs.
	Nitrogen.	Phosphorus.	Potash.
Fertility returned to manure	155	62	117
Fertility used in milk	51	20	40

If it were possible to preserve all the elements in the manure and if leeching and fermentation could be prevented, it would be possible to return the above amount of fertility to the land, but every practical man knows that this is not possible under ordinary conditions. It has been found by investigators that if a person returns 60 per cent of the fertility in the manure provided by the cow, he is doing splendid work. If butter-fat is sold from the farm and the skim-milk returned for feeding, we get much of the fertility back. In the feeding of skim-milk there is also loss and we cannot expect to return more than 60 per cent of the fertility or the elements required to make the milk, for there is a waste in handling skim-milk. The calf or animal to which it is fed takes some of the elements for growth and the fertility in the manure from the animals gives up some of its fertility to leeching and fermentation. If we assume that 60 per cent of the fertilizing elements in the manure and skim-milk is returned to the land, we get the following table:

	Lbs. Nitrogen.	Lbs. Phosphorus.	Lbs. Potash.
Fertility returned to the soil in ma- nure	93	37	70
Fertility returned to the soil through skim-milk	18	7	7
Total fertility returned to the soil in manure and skim-milk..	111	44	77

In the following table we show the amount of fertility used in the manufacture of 8,000 pounds of 3.8 per cent milk and the amount that we may reasonably expect to return to the soil and the loss:

	Lbs. Nitrogen.	Lbs. Phosphorus.	Lbs. Potash.
Fertility used	207	82	156
Returned to soil in manure if skim- milk is fed	111	44	77
By subtracting we get a total loss of	96	38	79
If the skim-milk is not returned to the farm we get an additional loss of	12	5	5
Added to the other loss we get..	108	43	84

Showing the total loss in fertility of the farm for each cow that will produce 8,000 pounds of 3.8 per cent milk per year.

If we had to go into the market and purchase these elements at commercial fertilizer prices they would cost in the neighborhood of \$22.00, but fortunately for the dairyman, the nitrogen which costs 15 cents a pound in the market can be obtained from the air free and there is an unlimited supply. It becomes necessary, however, for him to grow some legumes, such

as clover or alfalfa or cow peas for gathering this nitrogen from the air. This is no hardship, for every well regulated dairy farm should have a good supply of either clover or alfalfa or cow peas on hand. It is therefore safe to state that the farmer who practices the system of rotation and feeds legume hay, need pay no attention to the nitrogen supply of his farm.

Dr. Hopkins says that there is enough potash in the soil to last for many years and at the present time we need give it no consideration. In our calculation of the amount of fertility used, it will be noted that there are 43 pounds of phosphorus lost which can be obtained in the form of raw rock phosphate for the sum of 4 cents per pound or making the 43 pounds worth \$1.72, the cost of fertility that should be purchased for every cow kept in the herd. This calculation may be a little high for the average cow but it comes very close to what Dr. Hopkins advocates in retaining and building a permanent system of agriculture. He states that a farmer who is raising maximum yields of corn, clover, oats and wheat should apply 250 pounds of the raw rock phosphate annually or 1,000 pounds every four years. If we calculate that the raw rock phosphate furnishes phosphorus at 4 cents a pound, this amounts to \$1.25 per year per acre. It should be remembered that in my calculation, assuming that the cow consumed a certain amount of feed, it would require \$1.72 worth of phosphorus which is not very far from the figures advocated by Dr. Hopkins and based upon actual field tests. I feel, therefore, reasonably safe in stating that every dairyman should make it a point to purchase from \$1.00 to \$1.50 worth of raw rock phosphate for each cow that he keeps in order to keep his soil up and supply plant food for the production of maximum yields of crops.

I realize that many of the farmers in this community purchase a considerable portion of their feed; in view of this it is not necessary to purchase nearly as much of the rock phosphate as where no feed is brought to the farm. In the following table is shown the amount of fertility contained in 1,000 pounds of bran and 300 pounds of oil meal:

Amount and name of feed.	Lbs. Nitrogen.	Lbs. Phosphorus.	Lbs. Potash
1,000 lbs. bran	25	27	15
300 lbs. oil meal	20	6	4
Total	45	33	19

If the above feeds are purchased, we bring to the farm 45 pounds of nitrogen, 33 pounds of phosphorus and 19 pounds of potash, and after we take out the fertility used in the making of milk and make allowance for leeching and fermentation of the manure, we can calculate that about one-half of the fertility purchased in the bran and oil meal may be returned to the soil; or, roughly speaking, we would expect to return to the soil about 17 pounds of the phosphorus out of the 1,000 pounds of bran and 300 pounds of oil meal. Seventeen taken from forty-three leaves 25, as the pounds of phosphorus that it is necessary to purchase per cow to keep the land up to its original fertility. It has been found by experiment that the best way to apply the rock phosphate is to plow it under with green material or mix it with barn yard manure. Investigators have found that on an average, a ton of manure is worth \$2.00 and that if ten cents worth of raw rock phosphate is mixed with it, it increases its value to \$3.00.

It has been held by many that since dairying offers an opportunity for the rotation of crops, very little attention, if any, need be given the soil to keep up its fertility. No one questions that the rotation of crops is not beneficial to the soil; that it is one of the necessary things in a successful system of agriculture, but to state that rotation tends to increase the fertility is misleading in the extreme, for the increased crop yields that come by rotation should indicate that more fertility is being removed. We cannot make something from nothing. The rotation of crops puts the soil in better physical condition, it gives opportunity to grow crops which tend to liberate the fertility of the soil. The single crop system encourages the growth of weeds

whose habits are the same as those of the crop; the weeds require fertility and therefore take nourishment which belongs to the plant, thus decreasing the yield of grain or whatever the crop may be. The single crop system tends towards breeding of insects which are enemies of the crop.

I can well remember in Southern Minnesota, 25 to 30 years ago, where the single crop system practiced with wheat gave the cinch bugs an opportunity to develop. In order to get rid of the cinch bugs, farmers quit growing wheat and went into live-stock raising. Since this system of farming has been taken up I have heard little or nothing concerning the cinch bug. Fungus diseases develop when a single crop is grown year after year on the same soil. We have the flax sickness and clover sickness; smut destroys large quantities of the grain crop; the cow pea wilt, bean sick soil, etc., follow the single crop system. Plants also secrete from their roots substances which have a toxic effect upon the plants and for this reason it is necessary to change the crop.

Dairying offers an opportunity for the rotation of crops and raising of those crops that are of different benefit to the soil. For instance, what would clover and alfalfa hay be worth if it were not for the animals of the farm? It is necessary to grow these crops, for the bacteria which live upon their roots gather nitrogen from the air and deposit it in the soil. The roots themselves supply a large amount of organic matter which is necessary, for in the decomposition of organic matter acids are secreted which liberate the plant food in the soil.

I might go on and mention other advantages of crop rotation, but these which I have given are sufficient to indicate its value to the soil and how dairying encourages and gives opportunity for the rotation of crops. It is plain that the dairy cow plays an important part in our agricultural operations and makes it possible to handle the soil in the best possible way.. She not only returns a large percentage of fertility which the plants have removed from the land, but makes it possible to grow crops which are advantageous to soil improvement. She

also gives a market for a large amount of roughage which would be of little value without her.

Member: You would not give us to understand that we should not have a rotation of crops, would you?

Mr. Glover: The rotation does not increase the fertility of the land.

Member: The rotation of the crops adds greatly to the mechanical condition of the soil, does it not?

Mr. Glover: It improves the mechanical condition.

Member: How do you handle your manure that you treat with phosphates?

Mr. Glover: We put it on the ground that we plow for alfalfa.

Member: When do you sow alfalfa?

Mr. Glover: In the spring.

Member: When do you apply manure?

Mr. Glover: All the year around.

Member: Do you haul it direct to the fields?

Mr. Glover: Yes.

Member: Do you use a manure spreader?

Mr. Glover: We spread it on the snow on level ground.

Member: Has anything been discovered to kill the ground lice?

Mr. Glover: I have never heard of anything.

Mr. Newman: It is getting late and I think we will have to hold over some of our questions for this afternoon.

I would like to give a notice in regard to tomorrow's work on this tuberculin test question. There will be some cattle that react and some that will not. I want you to get together and see this so that you will gain knowledge on the tuberculin test. It will be a test on the test itself. You can go to the Kerber Packing House and examine them yourself. At 9:30 we will have street cars in front of this building which will take you all out there. We will keep the cars running until 10:30.

This afternoon we shall open the session with an address by Mr. J. E. Dorman, on "Silo Construction and the Use of Ensilage." Mr. Peters will be here afterwards. Do not forget our program is long and we must commence at 1:30.

We will stand adjourned until 1:30 this afternoon.



Wednesday Afternoon, Jan. 18, 1911.

President Wiggins: Tomorrow morning Dean H. L. Russell, Wisconsin College, Dr. John Scott of Peoria, and Dr. W. J. Fraser, Chief Dairy Department of the State University, will hold the postmortem on the cattle that are to be killed. I am sure none can afford to miss it. They will start at 9:30 and all those who desire to pass opinion on those cows can see them before 9:30 or up to the time we start to slaughter them.

One feature of that test that I have in mind is to see how many can pick out the reactors and non-reactors by physical inspection. I hear many say they can. If any of you feel that way I would like to have you hand in a piece of paper and mark on it the number of cows that you think are reactors and those that are not. For your own personal satisfaction after slaughtering you can see how near right you are. I feel that point should not be overlooked, making up your own minds as near as possible, whether or not you are capable of picking out these reacting cows or not.

This afternoon we have an interesting program. We have the pleasure of hearing from Mr. Dorman, who will speak to us on Silo Construction and the Use of Ensilage. I have the pleasure of introducing Mr. Dorman.

SILO CONSTRUCTION AND THE USE OF ENSILAGE.

By

J. E. Dorman, Editor Prairie Farmer.

Mr. Dorman: Members of the Association: I am pleased to have this opportunity to talk to you today on the subject of silos and silage, because I believe this feature of the feed problem means a great deal to the dairymen of Illinois.

Some of you present here today may think that this subject is worn out. The agricultural press and the institute workers have discussed this subject so much that the dairymen who do not own silos, and therefore do not realize the value of silage, have become somewhat indifferent. However, a careful estimate will show that 75 per cent of the dairymen of the state are still without silos. A great many have been built during the past year, and I believe that with their general use the silo will be as great as any other one factor in raising the average production per cow. This method of preserving green feed for winter use was introduced into this country about thirty years ago, but the stockmen were rather slow at first to take it up, until the experimental stations and agricultural press widely advertised the value of silage.

The New England farmers were the first to take advantage of this economical way of preserving roughage because they were compelled to economize, and I want to say that if the farmers here in Illinois would economize like the eastern farmers are compelled to do, there would be more thrifty farmers in Illinois than there are today.

The advantages of silage over dry feeding are many, some of which are:

1. Economy of storage space.
2. Conservation of the entire corn plant.

3. Provides a succulent and uniform food for the entire year.

4. Stimulates the milk flow.

Silage contains about 75 per cent moisture and for this reason the economy in storing has been questioned. Let us figure on this proposition. It requires 400 cubic feet to store one ton of hay and 50 cubic feet, just one-eighth as much, to store a ton of silage. Therefore, eight tons of silage can be stored in the same space required for one ton of hay. One ton of hay contains 1,700 pounds of dry matter, while eight tons of silage contains 4,000 pounds of dry matter, more than twice as much.

Again one ton of clover hay contains about 1,000 pounds of digestible feeding nutriment. Eight tons of silage, which can be stored in the same space, contains 2,000 pounds, just twice as much. Thus we find that the space required to store one ton of hay will store eight tons of silage containing two and a half times as much dry matter and twice as much digestible feeding nutriment. Now which would be the cheapest, to build a hundred ton silo or a barn to store 800 tons of hay?

The dairyman who feeds the ear of corn only, loses about 40 per cent of his corn crop, and he who feeds the ear and the dry stalk loses much, but he who stores his corn crop in the silo at the proper stage of maturity gets about all there is in the corn plant.

The 1910 corn crop in Illinois is estimated at 300,000,000 bushels. At least one-third of this is used for milk production. One hundred million bushels at forty cents would amount to \$40,000,000. If all of this corn was put in the silo it would add forty per cent in the value or \$16,000,000 more.

There is in Illinois something over 2,000,000 dairy cows. Dividing these up into herds of twenty cows each making 100,000 herds, the \$16,000,000 saved from one year's crop of corn by the use of the silo, is enough to build a silo for every herd in the state.

Nor is this all; silage induces a larger milk flow than the feed. A number of tests have been made showing that the feed-

ing of silage is responsible for an increase in the milk flow of from 10 to 30 per cent. Think what even a 10 per cent increase in all of the 2,000,000 cows in Illinois would mean. The average now is about 140 pounds of butter per cow per year. A 10 per cent increase would mean a gain of 28,000,000 pounds of butter. At twenty-five cents per pound would be \$7,000,000, at least half enough to grow the crop and fill the silos.

In building a silo there are several considerations which must be kept in mind. The first is to have one that will preserve the silage. In order to do this the silo must be air tight. The walls must be rigid and smooth inside and it must be perpendicular to allow the even settling of the mass. There are many styles of silos and they are made of many different materials, such as cement, concrete, brick and several styles of wooden silos. The concrete, of course, is more durable and will cost more than the average dairyman wishes to invest. The wooden stave silo costs less and seems to be the most popular. The life of the stave silo depends on the quality of the lumber used, but has the advantage of easy construction and can be moved if necessary. A few years ago the U. S. Department of Agriculture sent a number of men to the southern states, where the silo was practically unknown, to show the dairymen how a cheap stave silo could be built. About a hundred silos of this type were erected at the average cost of about \$1.50 per ton capacity. They can be built in Illinois at the same cost. In building a silo the first thing to consider is the site. It should be placed where it will be convenient for feeding, yet far enough away so that the odor from the silage will not enter the barn at milking time. The best way to arrange this is to place the silo at the end or one side of the barn, six or eight feet away, and connect the silo chute and the door in the barn by a corridor having a window on each side to create a cross draught that will carry out any odor left in the corridor. The door leading into the barn should be tight and kept closed when not in use.

After the site has been selected, drive a stake firmly in the ground at the place where the center of the silo should be, and

in marking out for the foundation wall, use a slat nailed to the center stake. Measure out on this slat a distance of six inches greater than one-half of the diameter of the silo, and describe a circle on the ground. Then measure back toward the center twelve inches and describe another circle. This will locate the lines for the foundation wall. Remove the earth to a depth below the frost line, exercising care to keep the sides of the trench smooth and the bottom level. Fill the trench with concrete and tamp well to remove bubbles. When this is done it will be necessary to use some thin boards to make a form for that portion of the wall above the ground. Drive stakes about two feet apart around the trench to hold the form in place. This form should be level on top so that when it is filled with concrete it can be wiped off leaving a perfectly level foundation wall.

This concrete mixture is made of five parts of broken stone, three parts sharp sand, one part good Portland cement. Mix the sand and cement well before adding the water and stone.

When the wall is completed and well hardened the staves can be set up in the center of the wall, placed edge to edge and spiked together with forty-d or sixty-d wire spikes. After the staves are all up, place the hoops around and tighten up. Cut out the necessary doors, put on a circular roof and the silo is ready to fill. No concrete floor is necessary where a hard clay subsoil is found; where the soil is porous, a concrete floor will be required, or clay to the depth of six inches must be added.

The size of the silo depends on the number of cattle to be fed. It should never be less than twenty feet high and thirty feet is better, for the height increases the pressure and the silage will keep better. At least two inches should be fed off of the entire top surface each day. Five square feet and two inches deep will just be about enough to feed one cow a day. Roughly estimating the feeding surface to be five square feet per cow, it would require for a herd of twenty cows a feeding surface of a hundred square feet or a silo twelve feet in diameter. For thirty cows 150 square feet or a silo fourteen feet in diameter.

Some dairymen have made a mistake in building silos too

large in diameter and have experienced considerable loss by moulding. It is better to have too small silos than one too large in diameter.

The actual cost of the silo depends on the material to be found on the farm. If sand and stone are convenient, no brick will be necessary, as a concrete foundation is best. Here is a bill of material for a ninety ton silo which was recently built and has proved satisfactory.

Size 14 x 29, concrete foundation, 3 feet deep:

132 pieces, 2x4, 26 feet long	\$41.75
9 hoops with lugs	24.75
50 pounds wire nails	1.75
4 barrels cement	10.00
Paint	3.50
13 days' labor at \$1.00	13.00
	\$94.75

This does not include any roof or concrete floor.

Corn makes the best silage. Other crops may be used, such as sorghum, clover or alfalfa, but corn has given better results. Care should be exercised not to allow the corn to get too mature, nor must it be put up too green. If too green it will not keep well because it will not be heavy enough to pack well. When the kernels are nicely glazed or at the same stage of maturity that corn is cut for stover, is the proper time also for silage. If for any reason the corn becomes too dry, water can be added from time to time, as the silo is filled or a better way is to spray the cut corn as it goes into the silo.

Silage is high in carbohydrates and for this reason should be fed with some protein feeds to balance up. Clover or alfalfa hay, wheat bran, oats, oilmeal or cottonseed meal will make a good combination.

A dairyman told me a few days ago that he was feeding nothing but silage. The agent who sold him the silo told him

that nothing else would be required. Any agent who will make such statements in order to sell silos is not using the best methods to promote their use.

In feeding silage the change from pasture to winter feed is not attended by a drop in the milk flow as is the case of dry feeding. Silage, being succulent and very digestible, stimulates the appetite and assists in the digestion of other food fed with it. It also has a very beneficial influence on the health of the animals. It can be fed during the dry months in summer as well as winter.

Summing up, then, we find that the advantages of the silo are: Economy in storage space, providing succulent green feed all winter, saves the entire corn plant, increases the milk flow and keeps the animals in good health.

As Illinois heads the list of states in corn production and is one of the foremost dairy states, it is up to the dairymen to see that the cow and the corn crop get together on this silo proposition.

President: Mr. Newman has an announcement he would like to make, but before he makes that announcement I would like to make public the names of the nominating committee and ask them to report as soon as they can.

Mr. Newman: I want to speak about the test tomorrow and the killing of the cattle and the postmortem examination. We first intended to have the animals killed in the building next door, but we find that so many will want to see and hear about it that it has been decided to go to the Kerber Packing Company, where we can all be accommodated. We have arranged for street cars to be in front of the building at 9:30 tomorrow morning; it is only a five or a ten minutes ride. All coming from the south can get off at the packing house instead of coming into Elgin, which will save you five cents. We will keep those cars running as long as necessary to get every one there.

Another matter, this Association is having such a successful

meeting here that we want to get a picture of this whole crowd so that we can send it to the state and show what we can do. We will take a recess of fifteen minutes and go to the outside and then we will come right back as soon as the photographer can snap you; arrange yourselves in front of the building and then come back. Rise as an army and march out there.

President: Ladies and Gentlemen: Mr. Phil Haner of Taylorville is here this afternoon and I want him to make a few remarks to you in regard to the Live Stock Breeders' Association, which is to meet in Springfield next month.

Mr. Haner: This is the best Dairy Association meeting I ever attended, and I want to congratulate you people of Elgin and this district in your good meeting.

I am in the live stock business; I am a farmer and a feeder. There is no question but what all kinds of live stock business is a benefit to our land. I do not want to take your time as Mr. Peters is going to follow me, but I want to say just a few words with reference to a meeting we are going to have in Springfield on February 7th, 8th and 9th, the State Breeders' Association; we will have hogs, sheep and dairy cattle.

This meeting was set for Springfield to have the people, the members of the Legislature and the Senate know that the live stock people in Illinois are alive and awake. We are asked to do a lot of things that we are not able to do financially.

One thing is that we are doing a lot of work to benefit all kinds of live stock. The live stock people have never gotten together; they have never shown the interest that they should show.

I want to use this illustration: The labor organizations get all the appropriations they want. Their office is across from ours. These people get it all. Why? Because they are organized; they go to their members. Every one was waited on before the Legislature met, consequently they are anxious to help those people. You have not been getting what you need, we have not been getting what we need. It is because the farmers

have not asked their members for it. If you people will take an interest in this matter, there is no question but what we will get what we are entitled to.

The live stock interest pays sixty per cent of the whole tax in Illinois, so I think you are entitled to some of the benefits. We asked for a laboratory; we got six thousand dollars for it, so when we got ready to start we were broke. We have saved over 250 to 300 thousand dollars of your money, and that is only one thing among a lot of others that we have done, and I would like to have you people take an interest.

At the Illinois Live Stock Breeders' Association meeting we will have the best speakers that can be produced; we will also have a judging school the last day. We have a thousand dollars in prizes to be given away. We want you all to come down to that meeting, but I am not going to talk about that. I want to say just this to you people in this part of the state, that the Live Stock Board of Illinois is as good a friend as the dairymen has in Illinois. There was an impression formerly that the Live Stock Board was going to come here and kill your cows. When we come and slaughter your cattle, the state will give us the money to reimburse you. We are not here for that purpose; we are here to help you and not to put you out of business. It is our intention to help you. The Board was created for that purpose, not for the purpose of doing you harm or injury. I want you to feel that way. You will find this board absolutely the dairyman's friend.

I want to speak just another word and tell you how much Dr. Peters, who is in a position to save you a whole lot of money and has saved you a whole lot of money since we have had him with us. He has saved the cattle men of Illinois a lot of money.

You have a good program and I do not want to take your time, but I want to thank you for the opportunity to say these few words to you.

President: I want to give you my word that there has not been a man without pay or with pay that has done more than

Phil Haner. He has given his time, his own money without measure, except that he wants to see the live stock business get ahead. Other states have gotten ahead and why not ours? Every dairyman who owns any cows or expects to stay in the dairy business should go to that meeting in Springfield in February to help boost in numbers at least, if you are only there for a little while, so that when Mr. Haner, or your representatives of the dairy school or the experimental station ask funds to carry on the development of the dairy interests that we will have something back of us to go on and see the Legislature; this will help us to have a better chance to get what we want.

With men like Mr. Haner and Dr. Peters, we have a strong board and you ought to make every effort to be there and post yourselves at the secretary's office and help Dr. Peters and myself in the judging contest at that Breeders' Association meeting. Any man who has had any college education, a two or a four weeks' course or any education in judging cows can enter and pull off good prizes. They are better than you have ever had offered to you in any contest.

Springfield will have room for you and everything is being done to have this both an interesting and instructive meeting.

I take pleasure in introducing Dr. Peters. He needs no introduction; he has spoken to us before. There is no one better posted on veterinary subjects in our state and we are happy to have him with us today. He will speak to you on "Diseases of the Udder."

(Dr. Peters reads his paper.)

Member: How do you make bismuth ointment?

Dr. Peters: 2 parts powdered bismuth to about 10 parts vaseline. You put your vaseline on a piece of glass and then your bismuth and mix thoroughly; sometimes you can add a little arnica or belladonna.

We have been experimenting the last few months with a new chemical that we think will be of great aid in reducing these acute inflammations of the udder. This material is injected with a needle just above the udder and in an hour or two you can see results.

Member: Is it safe to insert those silver tubes?

Dr. Peters: They are all right; a mighty good thing to use if you are careful. If you are not careful you can do more injury to the duct itself, then you are running danger of causing inflammation inside the cow. When the quarter is inflamed you jab one of those milk tubes in you break the tissue. If you do not keep it open you will have a closed tit.

Member: Would you leave the tube in?

Dr. Peters: There is the great trouble. You must have a specially constructed tube to leave it in. You must have one that has projections so that it will stay there, or you must have one to tie around the inflamed part. The thing to do is to leave the tube in and work it often to see that it is kept open and you will have a free flow. With the average tube the point is sharp and that is where the trouble will come in. With a lead probe the chances are that you will hurt the tissues.

Member: How much boracic acid do you use?

Dr. Peters: 2 parts of boracic acid to 98 parts of water.

Member: What causes the spider in the teat?

Dr. Peters: All these formations are brought about through an injury inside, then of course inflammation leaves a growth. These growths are dangerous if they come in contact with inflammation; it adheres there. These quarters are subject to various kinds of infection.

Member: What is the best thing to do with the after birth?

Dr. Peters: Remove the after birth as soon as possible. If it is not removed it causes many kinds of trouble in your cow because there is left in that large cavity a lot of membranes that will fester away. You will see pus formations. What is the result? Those pus germs are absorbed by the animal in the system. You must clean them out; that should be attended to the first thing.

Member: We have been told not to do that.

Dr. Peters: Why? I always advise it; I cannot see why it should not be done. The only danger in taking it away is this: if it was done by a person who is not familiar with the operation, danger will arise because the cow might be torn and a large blood vessel be severed and the animal may bleed to death, but if it is done by some one who knows how, it is the proper thing to do.

President: Do you have to irrigate?

Dr. Peters: The animal should be irrigated and washed and taken care of.

Member: What do you prefer to use?

Dr. Peters: I prefer permanganate of potash, 1 teaspoonful to 1 bucket of water. For instance I have had more trouble in former years in using coal tar dips in irrigating cows, say using them every day or every other day; I could not lessen the discharge; it would grow more copious; the result was I found this carbolic acid was too irritating to the mucous membrane.

Member: What do you think about corrosive sublimate?

Dr. Peters: It is all right, but it is dangerous to have it around. Another feature, the corrosive sublimate if it comes in contact with metal it corrodes. I use permanganate of potash entirely now; it has a pink color and you know about it.

Member: What are the causes for retention?

Dr. Peters: They are many. I may strike your hobby or I may not. I do not know as I have solved the cause. Some believe it is due to the kind of feed that they are feeding. I have known some dairymen believe if they fed balanced ration they would not have it, in one locality they said it was due to the ensilage; so you see what some people believe. I just think it is a certain condition that occurs. It may be that laxative feed would have some influence, but I doubt it. I just think nature has to take care of it. I do not believe that you can expel it by feeding large portions of sugar or carbonite of soda. I do not think they would influence it. It would take several days before you would know the result. If they have not been removed within six to twelve hours they should be removed.

Member: Why do we have abortion and retention more in summer than in winter under normal conditions.

Dr. Peters: That is only a theory; I do not attribute it to the feed.

I have taken quite a little of your time and I know you will be interested in hearing the remarks of Mr. Carmer, but before I take my seat I want to say a word about our laboratory which my chairman just mentioned. I am sorry that we are not able to furnish all of the people over the state the hog serum as fast as they request it, but we had so small an appropriation that if it had not been for Mr. Haner we could not have done nearly as much as we have. He gave us three car loads of hogs, enough for 26,000 doses. It takes a lot of money to make hog cholera serum. There is no reason why Illinois should not have hog serum in its borders. It is just a matter of how much money the state will give us to make this serum and thus prevent hog cholera. I believe you farmers want this and you ought to get it.

And further, I want to say we are publishing a large bulletin which will be out March 1st on the subject of the diseases of dairy cattle; you will find a useful pamphlet on the diseases of

hogs; it will be about sixty pages and will give you some useful information, so if you want to know anything about the diseases of dairy cattle, do not forget this is at your service.

President: Before Dr. Peters leaves the platform are there any questions; let us have them.

Member: Do you furnish a preventative for abortion?

Dr. Peters: Yes. This material will be sent you free of charge. I do not know what we would have done if we had not had those hogs from Mr. Haner. We have not had any money in my department since last October. I want to say that if I had had the funds I could have supplied 500,000 doses of rook vaccine free of charge. You know what that means to you.

President: We will now hear from Mr. Carmer. If the ladies would like to stay we would be glad to have them. We are very fortunate to have Mr. Carmer with us this afternoon.

Mr. Carmer: In Germany the farmer is for the fields and the ladies for the stables. Mr. President and Gentlemen: When I promised Professor Peters to attend your convention and speak I had in mind that I might speak about some of my experiences with animal diseases. So if I speak today about vaginal infection of cows I do it at the special wish of Professor Peters.

This disease is not only of importance to us in Germany, but to all dairymen throughout the world. The milk cow in order to produce as great a benefit as possible, must not only have regularly occurring periods of pregnancy, but parturition must occur, in our country in autumn or early winter. The complaint that a great many cows are sterile is common among the dairymen. The disease vaginitis is peculiar to the cow; it is essentially a catarrhal inflammation affecting the vulva-vaginal mucous membrane in the female and the prepuce and glans penis in the male. The causal agent is said to be a streptococcus, found in the deeper layers of the vaginal mucosa and in the mucopuru-

lent discharge. The irritation excited by the specific germ is followed by a swelling of the lymph follicles; these appear prominent on the surface of the mucous membrane in the form of numerous small firm glands. This catarrh may remain localized in the vestibule and vagina; on the other hand, it may extend forward to the uterus. This may cause systic degeneration of one or both ovaries—abortion and sterility.

The malady is described as a venereal disease in that it is often transmitted by coition; other factors in spreading infection are immediate contact (soiled tail and hind parts), soiled fodder and litter, hands, boots and clothes of attendants, grooming utensils (curry comb), and infection from mother during and after partuition. The quantity and virulence of the vaginal discharge are in direct proportion to the intensity of the lesions.

The disease is most intense in young animals in all stages of the catarrh; they are also most susceptible to natural infection. Three-fourths of the disease occur in young cows and heifers, and it is not uncommon to find a large number of young calves and virgin heifers show distinct granular lesions.

The incubation period depends largely on the activity of the virus. Inflammation may appear three to five days after coition.

In the acute form there is a swelling of the vulnar labia increased mucous, and considerable congestion and swelling of the vaginal mucous membrane. The cow evinces pain on manipulation, urinates frequently and scantily, strains and arches her back a little and shows uneasy movements of the tail and legs. Very soon the discharge becomes purulent and more or less copious; it adheres to the tail and tuft of hair, and is found on the floor of the stall; it is always odorless. The sticky nature of the discharge causes the pus to cling to the membrane in flaky shreds, hence on opening up the vagina a whitish grey shreddy coating is found lining the canal. The vulvar lips readily parted with the fingers when the granules are easily observed upon some portions of the mucosa, usually best on the side opposite to the observer. The granules differ greatly in color. In the intensely inflamed cases the granules usually partake of a deep injection

of the surrounding mucosa. In cases where so great irritation is present the granules stand out prominently. They are especially prominent in virgin heifers.

This disease is of great importance to the dairymen of this country and generally there are few farmers who realize how widespread it is in this country and how many thousands of animals you lose each year by this disease, so it is very important to fight it with vigor.

The diseased cows should be separated from the healthy cows and heifers and given new quarters. The old quarters must be very carefully and thoroughly disinfected. It is best to have a separate attendant for the two sections. If the same person attends both sections he should use a full set of clothing while among the diseased ones and remove it before going among the healthy ones. To adequately treat the cows which have vaginitis it seems to be necessary to disinfect the external genitals and surrounding skin and hair for a considerable distance with a strong disinfectant, as creolin, carbolic acid or corrosive sublimate; also to inject into the genital passage a disinfecting solution, preferably a .75 to 1.0 per cent solution of carbolic acid crystals. Such washing and injection should be repeated daily for a few days, then every two or three days for about three weeks and finally once weekly. On account of the recognized value of carbolic acid in the treatment of this disease it is probably a good practice, although largely empirical, to inject under the skin every two or three days a small dose of carbolic acid and to feed this drug once every day in the food. The dose for subcutaneous injection may be ten grains and for feeding twenty grains. In either case it should be made into watery solution of about five per cent strength with hot water. The diluted carbolic acid given with the food should be well mixed with it.

Cows which have vaginitis should certainly not be bred until they have been treated for a period of from four to six months. I am not sure that this is really long enough. In a cow that has vaginitis conception is almost impossible while she is suffering from the disease, and if conception does occur, abortion is almost

sure to take place. In treating animals for this disease it is well to make a special vaginal syringe; a gravity apparatus is used consisting of a large funnel, several feet of rubber tubing with a canula attached. A rubber tube ten feet in length, 38-inch bore and 3.4 inch outside diameter is to be recommended for both vaginal and uterine irrigation used with a funnel, attached to any enema pump, a pail or tank fitted with a stop-cock, or with a sufficiently large tube holder and suction plate to keep it down and prevent kinking. It is sometimes possible to suspend a large pail above and behind the cows and to pull it along the shed; this facilitates the work very much in large herds and economizes the cowmen's time. The irrigations with mild solutions are carried out twice daily for a few days, then once daily, becoming less frequent after two or three weeks. After washing out the whole vaginal canal insert a Bissulin Capsule once daily for a time, in capsule or pencil form; the pessary is best introduced as far as possible with the fingers.

It is absolutely necessary to prevent the animals from copulating until all inflammatory pneumonia has disappeared, and for a short time afterward, roughly six weeks. The irritation sometimes produced by coition, even in the chronic cases, has already been alluded to. Recovery is retarded, and infection may be conveyed in this way. It is good practice to syringe out the vagina with a one per cent solution of bicarbonate of soda before going to bull, in case an acid or neutral state of the mucous exists; the reaction should be feebly alkaline, and various conditions of the genital tract may alter this.

Little more need be said in regard to prophylaxis. If the sound animals are few in number, and other premises are not available, they should occupy stalls apart from the other cows to which the drainage does not flow, e. g., at the higher end of the shed. The sound cows should be dressed first, and all fresh arrivals disinfected and kept under observation. A garden syringe is useful for spraying the hind parts after cleansing the soiled vulva and tail.

Upon my suggestion Dr. Peters of the Biological Laboratory at Springfield conducted extensive experiments with Bis-sulin, and as he is present I hope he will give the audience his experience with this important chemical. Since this disease is of highly infectious character and since its distribution in this country may be very extensive, it is important that the dairy-man become familiar with it and treat their animals intelligently and systematically, thereby preventing the spread of this disease and incidentally saving many thousands of dollars to the dairy industry of this country.



CARE OF MILK ON THE FARM.

ByW. W. Marple, Muncie, Ind.

President: A very delightful paper. While we have had some good ones we are saving some of the best for the last. You all know Mr. Marple. He has come a long distance to talk to us today.

Mr. Marple: Eugene Field, the very distinguished and ever to be remembered American poet and humorist, whose production of "Little Boy Blue" made him famous and gave him a place in the hearts of the people of two continents, and will perpetuate his memory throughout all time, was at one time the guest of Royalty in England at dinner, where among other delicacies there was provided an elegant, tempting dish of strawberries. The hostess, noticing that he did not eat them, said to him: "Mr. Field, don't you like strawberries?" He replied: "Yes, but I was just thinking how they would spoil the taste for prunes."

I am thinking today how this audience (after a rich treat of strawberries) have had their taste spoiled for prunes, and I offer you my condolence for what you have to suffer, and my apology for having nothing to offer at this junction of this wonderful banquet, but a dish of prunes.

The care of milk on a farm is a subject that interests the dairyman or the producer, the distributor, the manufacturer and the consumer. Primarily, the most intensely interested person is the dairyman, and from his standpoint and on his behalf, I bring you this message, and on him, whose cause I am delighted to champion, will I depend for an abundance of good, clear, pure, rich cream to make this dish of prunes more palatable and more acceptable.

My supreme wish and my greatest ambition is that I might make some suggestion or give some admonition that would exert an influence for the betterment of conditions, and the more rapid development of what, beyond question, is the greatest branch of agriculture.

When asked to attend this meeting (notwithstanding the pleasure it gives me to sit in the councils of Illinois Dairymen) the demands on my time were such that I was tempted to say to your faithful and efficient secretary, what the little girl said to her brother. She had been a very naughty girl all day and had tried her mother's patience to the limit; finally, in the evening when she seemed to have exhausted every other mode of punishment without avail, her mother took her up stairs to her room and laid her across her knee and was administering a good spanking; the little brother heard the commotion; he went and opened the door to go in and when the little girl heard the door open she twisted her neck around until she could see who it was, when she said, "Charlie, go out and shut the door; can't you see we're busy." And I can assure you today that my sentiment was most forcibly expressed by the man who was ridden on a rail and when asked how he liked it, said: "If it wasn't for the honor, I believe I would rather walk." And yet, aside from the honor, and regardless of other duties, if through the power of suggestion some man is influenced to make his dairy more more sanitary, his milk or cream more palatable, more healthful and more valuable, his business more dignified, his conscience more sensitive, his character more exemplary, and in consequence the world is made better, than I shall have been fully compensated.

This is a delicate subject, because it deals with the most sensitive people in the world, and while there are certain characteristics peculiar to the dairyman, sometimes natural and sometimes acquired through the influence of conditions necessary for success, there is a difference in the qualifications, the deportment, the character and the results of different dairymen, as wide as the difference in the meaning of the following sentences: A shoemaker put up a sign, and it read "Adam Good

Shoemaker." A man came along and noticing it, read "A dam good shoemaker." A barber put up a sign over his door and it read: "What, do you think I will shave you for nothing and give you a drink?" Another man who was attracted by it, read, "What do you think, I'll shave you for nothing and give you a drink," and he went in to get shaved. A boy going along the street with a dog was met by a minister, and he stopped to talk to him. The minister said: "Whose dog is that?" The boy said: "It's mine." The minister said: "What is its name?" The boy said: "Its name is Moreover." The minister said: "That's a funny name; where did you get it?" The boy said: "I got it out of the bible; that's the name of a fighting dog that is told about in the bible." The minister said: "Well, I never came across that; where did you find it?" The boy said: "Doesn't the bible say 'And moreover the dog licked Lazarus?'"

I recognize in the dairyman an important personage, and he is legion; he is untrammelled by the boundary line of any commonwealth or country; his appellation is as broad in its meaning as—mankind. In many sections the dairyman is a boy; in England and in Illinois the dairyman is a man. In Scotland and Missouri the dairyman is a woman. A most striking illustration of this fact was given by a man who was asked by Missouri's Dairy Commissioner how the dairy business was progressing in his section, and he said it wasn't doing very much good; that the women had gotten so onerary that they wouldn't milk any more and they had almost abandoned the business. The dairyman's business is not the creation of a fancy; it is the natural outgrowth of necessity with all of humanity; it is not a new business, it dates back with the beginning of history and from the time of the memorable feast by Abraham, which was entirely from the dairy, up until the time of the opossum banquet given to Taft, the dairyman's products have been the most essential articles of diet at every meal.

A preacher on his way got drenched with rain, and when he reached the church door he met one of his deacons to whom he said, "I'm afraid I'm too wet to preach this morning." The dea-

con replied, "O, never mind that, you'll be dry enough when you get into the pulpit and get to preaching." I will refrain from going into statistics for fear of your rendering a similar verdict.

In the analysis of this question we are forced to acknowledge that there are some evils existing to be remedied, and in your state, through the enforcement of laws already on your statutes, enacted by wise statesmen long before their time was entirely occupied cleaning house, many of the dark spots have been removed and many evils eradicated; and while the greatest responsibility should and does rest on the dairymen, I believe there have been some conditions that tended to possibly excuse to some extent the carelessness and negligence on his part in the care of milk on the farm. There has not been sufficient reward offered for efficiency nor punishment for neglect. Milk and cream have been measured by the standard of color and per cent of butter fat, and in some instances the only requirement on the part of the purchaser of milk was that it must be white, and the manufacturer of butter has in too many instances paid as much for rotten cream as for sweet, and in view of the necessary care and work to prepare good cream and keep it sweet, as a matter of fact there was a premium on rotten cream—because it took less work to prepare it. There was a greater profit in it than good cream. The supreme penalty for scattering the germs of disease through the sale of milk, and starting epidemics of smallpox and typhoid fever has been the necessity of finding another milk market, or separating the milk and putting the cream on the market to be made into butter. Each year there are thousands of victims of the White Plague, among whom the seeds of consumption have been sown by the distribution of milk, the philanthropist continues to build and endow tuberculosis hospitals and the dairyman's conscience is eased by the remembrance that he drank the same kind of milk when he was a boy that he is selling now and there is nothing the matter with it. Is it any wonder that the care of milk on the farm has had but little or no attention? There is another reason for neglect in this particular. Until recently the

dairyman's business and the dairyman himself has not had the recognition that the volume and character of the business he did was entitled to. The man who kept a few cows from which he was getting sufficient revenue to pay all of the expenses of the farm considered it a side issue; he never mentioned it, he was ashamed to tell it. He never attended a Dairy Convention and the man who made a specialty of dairying was, in the estimation of the public, "only a dairyman." The cattle man and the horse man have been courted and catered to, while the financial and social world has given little recognition to the dairyman. The politician has cultivated the dispenser of whiskey and beer, and at the same time utterly oblivious to the existence of the man who deals in milk. Laws have been enacted for the protection of dogs, while bills in the dairyman's interest have been laid on the table; the manufacturers of machinery have been protected by patents, organized trusts to govern prices. They have traveled on passes and have been permitted to sit in the councils of Railroad and Trust Magnates, while the dairyman has entered the markets that were open to him, unprotected and without attempted organization on prices. He paid his own fare, kept his own counsel, fought his own battles, and his highest ambition, a clear conscience and prominent seat in the councils of his own family.

The bank teller cleans the counter, and asks the crowd to stand aside when the tobacco raiser comes in once a year to make a deposit, and with his face one radiant smile, says: "The president would like to see you in the office for a little visit," while the patient, honest dairyman who deposits his mite daily waits his turn and is waited on by the Collection Clerk and does his visiting with the janitor, all because he is "only a dairyman."

The stockman who markets his product once a year, when he goes into a mercantile establishment is waited on by the proprietor and gets a discount on what he buys, while the dairyman who markets his product every day, transacts his business with the cash boy and pays the regular price for what he gets.

The banker who does business on the dairyman's money is importuned to buy an automobile, while the dairyman's mail is only circulars from the manufacturer of milk wagons. The dairyman can always be found at home, from necessity, while the grain raiser goes every Saturday to visit his wife's people and stays till Monday; the dairyman counts the proceeds from his product in nickels; the wheat producer counts his in dollars. The dairyman spends his summers in the pasture and feed lot and his winters in the cow barn; the stock dealer spends his summers on the lakes in the north and his winters in California, Florida and Mexico. The dairyman takes his product to market in a tin can, the corn raiser takes his in a box car; one sells by the pint, the other by the carload. The dairyman has a steady job, his work never ends, while the farmer works four months and loafes the rest of the year.

These are some of the impressions and mental comparisons, and because of this I am disposed to be charitable toward some for the conclusion they have arrived at, and my mission today is to reassure the dairyman, and impress those who are not dairymen, with the dignity and importance of the man's profession who is "Only a Dairyman"; and if I am talking to a man today who is prejudiced, my effort will be the same as the little girl whose grandmother visited her home for the first time, and she said to her: "So you are my grandmother, are you?" The woman said: "Yes, I am your grandmother on your father's side," and the little girl said: "You'll soon find out that you are on the wrong side."

I would send this message to a legion of my Illinois friends who are wearing out their land by drawing on its fertility and putting nothing back, you are on the wrong side. I am glad, that to some extent, sentiment has changed, and with this change has come an improvement in the care of the milk on the farm, and as this wave of sentiment spreads, many evils will be corrected. The woman who expects company to dinner puts on a clean tablecloth, brings out her best dishes and prepares for that meal the most palatable articles of diet and in the most

tempting manner. The commendation of her company justifies her effort and brings into use household articles that would otherwise be unused and makes her a more efficient cook and a better housekeeper.

At a Royal reception the Queen was asked to exhibit her jewels and she withdrew and came back with two interesting children, and with her hands on their heads she said to that distinguished assembly of Royalty, "These are my jewels."

Mr. Roosevelt might talk about race suicide until aviators were used to deliver milk, and until the extension of the Chicago & Northwestern Railroad had reached the North Pole, and the effect would not compare with that produced by this illustrious queen. When children become the most popular jewels, diamonds will be at a discount, and race suicide will stop. When the minister arranges to call, the most conspicuous thing on the center table is a bible, and if nobody calls but preachers, the bible would stay there, but when club members call, you will find in its place a cribbage board, some poker chips and a deck of cards.

When the politician calls, you take him around and introduce him to the most prominent men to impress him with the number and kind of acquaintances you have. When a dairyman calls you visit with him in your office with the door closed and the blinds down. The politician is careful of his record and his reward is a position of trust; the dairyman is careful of his reputation and his punishment is solitary confinement and eternal ostracism. You visit the country and examine the horse barn and admire the horses. You go to the hog pen and are pleased with the hogs. You flatter the farmer on his fine growth of alfalfa, and you go wild over a field of corn that will make sixty to seventy-five bushels to the acre when it ought to be made to produce two hundred bushels, and after looking over his entire farm and all his stock except his milk cows you go away without saying a word about his nice clean cow barn, his well-appointed milk house or anything in connection with his little

dairy. Do you think he is impressed with the importance of Care of Milk on the Farm?

Human nature is the same everywhere, and my plea today in the interest of the dairyman and his business, and more especially in the interest of a better country and in the interest of the boy who is undecided about staying on the farm, is, give dignity to this man who is "Only a Dairyman," and popularity to his business by your endorsement and DO IT NOW. Give him a place among the manufacturers of the world; welcome him in the Council of Finance; PLACE HIM WHERE HE BELONGS in the public opinion, and the effect will be what it always is. The world loves a winner, and the people seek the successful side.

In the fall of 1900 I happened to be in St. Louis and about eight o'clock one evening I walked west on Olive street toward a crowd that was going into the Exposition building. I sauntered in and found about a half acre of people, and I soon found that I had gotten into a political meeting. It was not long until the meeting was called to order, and a distinguished looking gentleman was introduced as the speaker of the occasion, and the very first utterance he made, after straightening himself up to his full height was, "I am a Republican." You ought to have heard the crowd yell; you would have thought it was a wonderful thing to be a Republican. I learned afterwards that he was getting \$5,000 a year for being a Republican. Two weeks after this I was called to St. Louis again and in the same building they were holding another meeting. I stepped in and found about an acre of people; I soon learned that this was another political meeting. This meeting was soon called to order and a man fully as distinguished looking as the speaker at the former meeting came forward and was introduced. His first utterance was, "I am a Democrat," and I thought something had happened. The shout that went up from the crowd could have been heard ten blocks. I learned afterwards that he was charging \$4,500 a year for being a Democrat.

I had the honor of representing the State of Nebraska at

a Farmers' National Congress. There was an immense crowd, an intelligent crowd. The greatest National meeting was called to order, the preliminary exercises were over, the orator for the evening introduced. He was bright looking, a man of notoriety, he was a distinguished looking man, and his first utterance was, "I am a Dairy Farmer." The stillness was painful, not a response. The man who had educated himself in every branch that would fit him for any position, that great specimen of health and happiness; one of nature's noblemen; that man who had chosen from all the avenues that was open to him what (to my mind) was the greatest profession in the category, and availing himself of this opportunity, in the presence of thousands of people, in the strength of his manhood and in the glory of his high calling to declare himself, not only a friend and advocate of the best organization in the world, but a member itself and an enthusiastic believer in the justice of their cause, and in all that vast concourse of people, not an audible response. My first thought was my own boy, who was just arriving at an age when he must decide what his occupation in life would be, with a strong inclination toward farming, and of course anxious to select an occupation that would be remunerative and at the same time pleasant. He had but one guide that was prominent, he had a right to expect that his future could be seen in the reflection of the past; of those who had trod the path that he was seeking. He could judge of their contentment and their satisfaction by their enthusiasm, and I wondered if he could have attended these meetings what his conclusions would have been as between a Republican and a Democrat and a farmer. He had the right to believe that the most popular was a Democrat.

I am glad that the time has past when the idea prevails that a man who is unfit for anything else can farm successfully, and that the poorest of farmers make "Only a Dairyman." I am thankful that institutions of learning are being established and are now being operated where our boys can especially fit themselves for agricultural pursuits in a way that they may get

pleasure out of their work as well as attain the most satisfactory pecuniary results. I am glad the time is past when we adopt measures in our business and pursue certain lines on our farms, simply because it is in accordance with the policy pursued by our forefathers, whom, we are sure were the best people on earth. We realize that this is no evidence of inferior judgment on their part, and this is no sign of presumption on our part. With the highest degree of respect and reverence from what we have learned through this source, for the precepts and example that come to us from past ages, we simply appreciate that conditions are different in every particular, and it is absolutely necessary that methods should be changed.

I am told that years ago up in the northern part of the country where I was raised, a candidate for Congress started out on his campaign with a speech and a barrel of whiskey. When he had a meeting he set up his barrel of whiskey, knocked out the head, hung the cups all around it and invited the crowd to help themselves, and while they were doing this he expounded the gospel of that political faith to which he had subscribed. You couldn't carry on a campaign that way now; candidates have changed the program. They used to have a barrel of whiskey and a four hours speech. That proposition won't do now.

You have heard of the steamboat landing at a prominent place on the Mississippi river with a lot of tired and hungry men. The Captain sent one of them with a five dollar bill to lay in a supply of provisions. When he returned to the boat and was asked what he had got, he reported four dollars and fifty cents worth of whiskey and fifty cents worth of bread. Somebody asked him what in the devil he wanted with so much bread. A campaign now with whiskey and speech wouldn't need much speech.

Webster's definition of a dairyman may have been a good one when he made his dictionary, but it doesn't cover the case now. It's not up to date. It reminds me of the two darkies who met one morning and one of them was carrying a basket with

a cover on it, and the other one said: "Mose, what you got in dat basket?" He says: "I'ze got some fine angora cats; don't you want to see them?" And he very carefully uncovered a little space and showed them to the old ducky, who said: "Mose, what's you call 'em?" His reply was: "I call one of 'em Taft and the other Roosevelt." The old darkey said: "Oh, that's no good; them's back numbers. Why don't you call 'em Cook and Peary?" Mose said: "These ain't Pole cats."

The twentieth century dairyman may be to some "Only a Dairyman." He may be, and is, one who produces milk and makes butter and cheese and deals in dairy products, but he is more than this. He stands for progress and in the evolution of dairying; he keeps abreast with the times. He is an intelligent man because he finds in his business the most remunerative market for brains; he is a reader of dairy literature and a student of dairy methods because in his business "Knowledge is Power." He is not a loafer, spending his time at the cross roads store trying to regulate the government, but a man who tends strictly to his own business because he finds it profitable. He is a family man, a home lover and spends his time there because there is where his heart is. He is a soil builder instead of a soil robber, because his business enables him to return to his land the life-giving force that has been taken by raising grain. He is a clean man because his business encourages and demands it. He has written on the tablet of his memory "Cleanliness is akin to Godliness," and in his social as well as his business life he forcibly illustrates the truth of this. He is a home builder, a home provider, a home furnisher, a house decorator, a farm beautifier, because his business provides for him the necessary means, and the nature of his business is such as to develop a taste for the beautiful as well as the comforts of life. He is a temperate man, as well as chaste in his language, because the source of his income would not do business with him if he were otherwise. Besides this, he is a voter: He is a good dry goods and grocery customer. He keeps a bank account and he is the highest type of American citizenship. He furnishes

an article of diet that is not only a delicacy but an absolute necessity for the completion of every meal. He provides for the motherless baby the only means of sustenance and saves to the world a precious human life, an immortal soul. He enters the sick chamber and the hospital wards and with his product, the Elixir of life, he nurses back the emaciated victim of disease who is lingering on the border land of that country from which no traveler returns. He is the producer of the only balanced ration for the weak and the strong, and I come to the Illinois dairyman today, and in behalf of Illinois babies and Illinois invalids and Illinois mothers, and the great Commonwealth of Illinois, I beg of you to let your most prominent care be The Care of the Milk of the Farm.

The dairyman is the one indispensable manufacturer. He is of equal importance in the Palace of Kings and the hovel of the poor. His possibilities are limitless. He stands pre-eminent and alone as a philanthropist, as with daily regularity he distributes to unnumbered voyagers nature's only life preserver, and he is "Only a Dairyman." Only a drummer boy, but in many a historic battle it was through the inspiration given by his music that urged a disorganized and terror stricken army on to victory, that but for him would have suffered ignominious defeat. Only a news boy, and we forget his importance as he hurries hither and thither carrying the latest news and leaving at our door-step, while the world is still asleep, messages from the remotest corner of the earth and making it possible for us at breakfast to get not only the political and financial situation in the new and old world, but the market reports from the commercial centers of the earth.

Only a clerk, and yet without him the wheels of commerce would stop. On him rests a responsibility that no one else can bear. He occupies a position that no one else can fill. He is the connecting link between labor and capital. It is he that oils the machinery and applies the steam that moves the great engine of commerce and transports the necessities and the luxuries of life from the few to the many.

Only a street car conductor, and yet he has in his charge thousands of precious lives every day, and as the great seething mass of humanity in the congested city go to and fro from home to business and from business to home, he delivers them safely to their destination and as he crowds back and forth from front to rear, and from rear to front, collecting nickels and ringing the bell that announces another passenger, his eager eye is ever alert to dangers that surround, and with tender care he helps on and off the unprotected child and the aged that are infirm, and his only reward, aside from the consciousness of doing his duty, an occasional thank, and a dollar and seventy-five cents a day.

Only a telegraph operator, and through the long dreary hours of the night he directs the snorting, puffing engine that hauls untold millions across the continent and who would be in constant danger of disaster and death without his constant vigil. He who surrounded by water and in the very face of death apprised the world of a Galveston horror and with almost superhuman strength and courage sits by his instrument and summons help to save a cargo of human lives that face a watery grave on a foundered ship.

Only a seamstress, and as she toils from day to day to clothe the world, with a compensation of a few pennies carrying to a humble home each night the provisions her earnings will purchase to appease the hunger of her orphan children, she deserves the plaudits of the enlightened world.

Only a farmer boy, and although his early life may be one of obscurity, he is preparing himself for future eminence, and as he tills the soil and plants the seed and reaps the harvest, he is happy in the consciousness of being one of an army that feeds the world, and to him all honor is due, and as he breaths the pure air from Heaven and communes with nature and realizes his partnership with the God of the Universe, he develops into a manhood in whose house I would rather be a doorkeeper than to dwell among Kings.

Only a dairyman, and this opens to me a vision, and in it

I see a million sturdy, intelligent, patient men feeding and milking and delivering to a world yet wrapt in slumber, the product from the faithful animals that are their special care. I see a million active boys as they follow the winding path twice a day in the summer and drive the cows from a distant pasture, and in the cold, frosty mornings I see them skip to the feed lot and make old Red get up quick so they can warm their bare feet that are almost frozen. I see the historic milkmaid with the milk bucket on her arm as she wends her way toward the cow lot humming a tune, the likes of which no operatic singer ever produced. I see the lonely widow woman in an obscure country struggling to maintain a home and keep together a family of children, and whose only hope is a small dairy herd and in her are all the graces of a true woman centered. On her brow is a crown of Glory and her robe of Righteousness is as spotless as the driven snow. To her is due the homage of a Queen, and for these I come here today as their representative to ask your consideration and demand your recognition of those whose business is of such vital importance to America and the perpetuity of which means so much to Illinois. I not only ask for recognition, but at this time of peril to this great industry, I ask your protection, and I feel like the boy who hesitated to go upstairs alone to bed during a very severe thunder storm and his mother went up with him and told him he needn't be afraid, that God was with him and would take care of him. Soon after his mother went down stairs there was a vivid flash of lightning and a keen clap of thunder and the little fellow went to the head of the stairs and called his mother, saying: "Mamma, let me go down with papa, and you come up here and stay with God."

While the lightning of wealth flashes across the dairyman's firmament and the thunder of oratory shakes the very walls of Congress, let the dairyman stand with the best protector from financial storms they have ever known, and you go and stay with the Gods of war in the oleomargarine camp until the storm is past, and the dairyman's sky is cloudless.

A representative once asked a lawyer to draft a bill for a

dog law, and he said: "Make it so it will satisfy my constituents and won't interfere with the dogs." I would say to the Illinois representative, the opportunity is now presented for you to introduce a Bill that will satisfy your dairymen constituents and not interfere in any way with your constituents that are producers, and at the same time a direct benefit to those consumers to whom you are indebted for the position you occupy. Take advantage of conditions, and render this most valuable specific service and there will be an abundant harvest for those who place in your hands a sacred trust. Don't let it be said of you what the boy said of his father when he was being coached in arithmetic to make a proposition plain to him; the teacher said: "Now suppose you would loan your father \$100, and he promised to pay you \$10 a week, how much would he owe you at the end of seven weeks?" The boy said: "One Hundred Dollars." The teacher said: "I'm afraid you don't know arithmetic very well," and the boy said: "May be I don't, but I know my father."

As I contemplated the personnel of the audience that would assemble here tonight and the different interests and pursuits that would be represented, and as I read the program and saw the different subjects that were to be discussed, I recognized in the request to the sentiment selected for me, a tribute of honor and respect to the dairymen of Missouri. I am not unmindful that the credit is due to a wonderfully increased interest in dairying brought through a combination of influences, the most prominent of which is this institution of learning and the officers connected with it in various capacities.

I am reminded of the discussion that took place on the train some years ago during the campaign of McKinley and Bryan; one man was betting that McKinley would be elected and the other that Bryan would be elected. An Adventist on the train heard the discussion and went over to where they were sitting and said: "The Lord with his Angels is coming to reign," when some enthusiastic Missourian said: "If he starts a third party I'll bet he doesn't carry Missouri." It's a source of great

satisfaction to every loyal citizen of this State that dairying is going to carry Missouri without any third party, for in its development there is no industry, no vocation, no pursuit but what has been benefited, and I am glad it is a business that doesn't have to be builded on the ruins of something else.

It is said that in Minnesota when a man goes into a bank to borrow money while the banker is asking him how much he wants and how long he wants it for, he looks out through the wicket at the man's feet, and if his boots are clean he tells the man he can get the money, but according to the rule of the bank he will have to get some good man to sign the note with him, but if he has milk on his boots he can get all the money he wants and doesn't need any signer. The Mason wears a square and compass badge; the Odd Fellow a three link pin; the Woodman an axe; the Cattleman wears spurs; the mule man carries a whip; the tobacco man is known by his odor; the miller has flour on his hat; the mechanic, sawdust; the brick mason, brick dust; the plasterer, lime; the shoemaker has holes in his shoes; the minister wears a white tie; the doctor smells of medicine; the merchant is known by his immaculate dress; the farmer has hayseed in his hair, and the dairyman, with milk on his shoes has the only insignia of a profession that can borrow money at a bank without an endorser.

A dairyman in Minnesota without milk on his boots would look as unnatural as the distinguished lawyer who has his picture taken in a standing position with his hands in his pockets. He had a cut made, and when it was published in a paper, some one looking at it said to a friend: "Ain't that natural?" And the other man said: "Not very; he's got his hands in his pocket."

The life of a dairyman is a strenuous one. If you are like the boy whom the minister asked what parable he liked the best and who said he liked the one that tells about the man who "loafs and fishes," you had better stay out of the business. There is no loafing and not much fishing in this business, although I have heard of a minnow being found in the milk occasionally

over in Indiana. Fellow citizens, I am reminded today of that popular musical play, "The Time, the Place and the Girl." Synonymous with this thought is my impression of the time at which this meeting is being held, as well as the place and the purpose. In the language of Herbert Kaufman, "Time, the Eternal book-keeper, is closing another ledger." To me, it is a time for serious thought; the clock of time has struck the closing hours of the dying year; we have held the pulseless hand of 1910, and at the same time have felt the throbbing touch of the hand of 1911, as the new year was ushered in with its bright prospects, joy and hope of triumphant success. In the year that is gone, have we made the burdens of life heavier or lighter; have we scattered sunshine or cast shadows; is the world better that we have lived? Some of us are at the base of life's mountain while others have almost reached the top. As we balance our books to open a new account, let us profit by the mistakes of 1910; let us avoid them in 1911. Let us do unto others as we would have others do unto us; let our motto be, "Do It Now." The touch of human sympathy is like sunshine to the drooping flower; let us lend a helping hand to the unfortunate; let us help to bear somebody's burden; let us prove to the world that we believe in the Brotherhood of Man.

Are you loyal to your convictions? Are you loyal to the sacred trust placed in your hands by an ever-ruling Providence and a confiding public? Are you true to the requirements of the statutes? Are you true to the voice of conscience? Are your books balanced? Is your record clear? Are your accounts straight? Is your business life an open book that can be read by the Dairy Inspector, the public and the Supreme Judge? Have you a good case? Is it prepared for the court of final decision? You have doubtless made mistakes, that is our common lot. In the language of Homer Wilson "Let us square our accounts with all mankind and draw the mantel of charity over those who have misused us, and as the sands of time fall into the grave of the departed year, let memory plant a few flowers of perennial freshness and beauty, while the hand of love writes

the epitaph of unforgotten virtues. To you who are not dairy-men, what is your life? What have you done to assist in this battle Royal for Dairy Supremacy in the Grand Old State of Illinois? Are you a milk dealer? Have you insisted on good, pure milk? Have you said to the man who furnishes you milk, "Clean up your barns. Take better care of your milk on the farm and send it to me with the stamp of purity." For the dairyman's encouragement it is very noticeable that when milk is plentiful, the best milk is never a drug on the market. Are you a creameryman? Have you insisted on good cream? Have you explained to the dairyman that furnishes your cream that during the stagnation in the butter market, that amounts to almost a panic, there has never been a time when the highest grade of butter was not in active demand. Have you explained to him that it is only possible to make good butter out of good cream? Have you urged him to remember that the future of his business depends on quality? In my opinion, the line is going to be drawn very closely in the future.

The Illinois hog has been the pride of the Sucker state and has found his way into the markets of the world, and in connection with the Illinois steer has made it possible to sustain the greatest packing industry of the world in the metropolis of this great state. Illinois oleomargarine and butterine has found its way into the commercial centers of the world, and has given this state some notoriety. Illinois has been regarded the home of the dairyman; the place where gilt-edged butter was made, the central market of the United States, and at this meeting place is the price made by which commerce in dairy products is carried on. Some of its reputation you may well be proud of, and I am sure I voice your sentiments when I say that you are not going to be satisfied to stake the reputation of a State like this on its past record for good butter, its reputation for beef cattle, hogs and oleomargarine.

Although "Only a Dairyman" he has a long line of ancestors he may well be proud of, and the Illinois dairyman, in my opinion, lives on the very spot that Moses viewed when he

led the children of Israel out of bondage. He belongs to an army of manufacturers who produced last year nearly a billion dollars.

Let us leave this message with you today; it comes from the dairymen who are not here; it comes from the Illinois mothers whose duties at home preclude this privilege; it comes from Illinois boys, full of hope, full of ambition. I bring from them an expression of gratitude for this recognition of their interest, and for what you have done and what you are doing in their behalf; and Mr. President, members of Illinois University Faculty, members of the State Board of Agriculture, if I could to-day from all the languages of earth select the most expressive adjectives and weave them into garlands of praise, it would but faintly express the gratitude we owe you.



Election of Officers.

President: Ladies and Gentlemen, we have tomorrow a very full program, and yesterday morning we were disappointed in not hearing Professor Fraser, so I know you are not too tired this afternoon to hear him talk to you.

I am afraid with the other speakers tomorrow afternoon and the demonstration in the morning we might not be able to get his address in. As this is an illustrated lecture it will be very interesting to you.

I would like to ask if the Chairman of the Nominating Committee is ready with his report. Mr. Newman, will you take the chair.

Mr. Newman: Mr. Schuknecht, this matter is brought up at this time on account of the long program that we have for tomorrow.

Mr. Schuknecht: Ladies and Gentlemen of the Convention—I have had the pleasure of attending the meetings of the Illinois Dairyman's Association for the last few years and have been particularly interested in the good crowds and the enthusiasm shown by the dairymen of this section, and I think the meeting here is distinctly a credit to the dairymen of Elgin and vicinity as well as to the State of Illinois. It is a tribute to the officers and committee who have been in charge of the Association and who have worked so hard for its success.

In choosing the names of men for the officers of the Association for the ensuing year, the success of this meeting must be considered and your Committee has endeavored to select the men so as to insure the continuance of the efficient work that has been done the last few years.

I beg leave to report that we have selected for :

President—Mr. J. P. Mason, Elgin.

Vice President—L. N. Wiggins, Springfield.

Directors—Joseph Newman, Elgin; Charles Gilkerson, Marengo; A. F. Jansen, Effingham; Edward Sudendorf, Clinton; John Lynch, Olney.

Mr. Newman: It is moved and seconded that the Secretary cast the ballot for these names. The motion is carried by unanimous vote and I declare that the names of the men who have just been read have been elected for the ensuing year.

Professor Fraser, who is chief of the Dairy Department, University of Illinois, has some thoughts in regard to the Profits in the Dairy Business.



SOME FACTS INFLUENCING THE PROFITS IN MILK PRODUCTION.

By

Prof. W. J. Fraser, University of Illinois.

The amount of milk and butter fat produced per acre is, generally speaking, the final test of profitable dairying where all feed is raised on the farm. This depends not only on efficient cows, but also on raising crops that contain a maximum amount of digestible nutrients, and especially protein, which is so essential for dairy cows. This address explains and compares four different systems of cropping for dairy farms. By the first two, 160 acres of land will support the equivalent of 38 and 51 cows, respectively. The first will make 991 pounds, the second, 1,475 pounds, the third, 2,025 pounds, and the fourth, 3,150 pounds of milk per acre. The poorest system of cropping returns \$15.16 per acre in milk, and the best system returns \$48.20 per acre. The first system will give an annual return of \$2,627 from the farm, and the last, \$8,246 or more than three times the first.

But this is not all. The net result as to nitrogen in the soil is to lose 1,900 pounds annually in the first system, to gain 110 pounds in the second, 2,280 pounds in the third, and 5,830 pounds in the last. These differences are due entirely to the kind of crops raised and their adaptability to the feeding of dairy cows, for the cows are figured as the same natural efficiency and the soil equally productive, in each of the four systems. It is certainly worth while to consider crop plans that make such differences in the returns and in the maintenance of the soil.

Several Reasons for Poor Results.

The investigations of the Department of Dairy Husbandry during the past dozen years show plainly that the dairy farmers



Ayrshire—Belle Douglas of Riverside (University of Illinois.)

	Lbs. Milk.	Lbs. Fat.
1st Lactation period, 365 days	5797	300
2nd Lactation period, 365 days	7681	394
3rd Lactation period, 313 days	6794	321
4th Lactation period, 365 days	6946	305
5th Lactation period, 303 days	7403	339
6th Lactation period, 330 days	6755	315
7th Lactation period, 300 days	6973	315

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are not getting the profits they should get for the investment of time and money spent in the business of milk production. There are several reasons for these poor results so frequently obtained. One is inefficient cows; another great waste is in raising crops that do not yield anything like the maximum amount of digestible nutrients per acre that is possible to obtain. This is especially true in regard to the protein contained in the crops commonly raised on the dairy farm and so essential in the ration for dairy cows. In many sections of the United States corn should form the basis of the ration, and the other portion should consist of some crop that is best adapted to balance the corn.. For example, an acre of timothy hay does not contain more than one-tenth as much digestible protein as an acre of alfalfa hay. Notwithstanding this fact, timothy hay is extensively grown on many dairy farms and fed to dairy cows.

Condition Found in Dairy Sections.

A few examples may help to bring out the conditions existing on some farms in the dairy sections of Illinois. Not long since, the speaker visited a large dairy farm in the Elgin district, where the tenant had been on the farm for fourteen years without sowing clover or other legume seed during this time, thus showing the same defect as system No. 1. Just across the road was a large dairy farm on which ten acres of clover were grown. In March this man still had the clover hay in his barn and was inquiring for a market where he might dispose of it, as he said he had so much corn stover he could not feed it out before time to turn the cows to pasture. He made a gross mistake in not feeding this legume hay, which would have taken the place of much of the high-priced bran, which he had been buying in large quantities all winter in an attempt to balance the ration for his dairy herd.

Since there are many dairy farms in Illinois that approach these conditions, where the farmers attempt to go into dairying by simply putting cows on the farm without changing the crops raised, and continue indefinitely without attempting to adapt the

crops raised to the best ration for a dairy herd, it has been thought wise to show a comparison of results—the relative efficiency—of different systems of cropping on dairy farms. This has been done by figuring out the amount of nutrients produced annually by the different crops in the various systems. From the results thus obtained has been determined the average amount of milk that can be produced by feeding these crops to good dairy cows under ordinary farm conditions. Four different systems of cropping have been compared, using in each case, 160 acres of good land and producing all of the feed on the farm, as this is the only way to make the four systems comparable.

The Four Systems of Cropping.

Four acres of every quarter section as called for in the deed are used for public highways, and another four acres are allowed for buildings and yards, leaving 152 acres for actual cultivation. The crops raised and the rotation practiced under each system are as follows:

System No. 1.—Corn, oats, corn, oats, timothy, pasture, pasture, pasture.

System No. 3.—Corn, corn, corn, oats, clover, alfalfa, pasture, pasture.

System No. 4.—Corn, corn, corn, corn, corn, alfalfa, alfalfa.

The comparisons to be made here in detail show what one going into the dairy business may reasonably expect to accomplish from each of these systems; they should be of even greater value to established dairymen by pointing out the great advantage of raising the proper crops and adopting a good system of rotation, especially one containing a large acreage of legumes, preferably alfalfa, and also a large acreage of corn for the silo.

Figuring the Same Yields in Four Systems.

The entire farm in each case has been figured as tillable, and all the land of good quality and well drained. However, the

larger the proportion of untillable land in a farm, the more important it is that the tillable area be devoted to intensive systems of cropping. In order to have the systems of farming on the same basis, it is necessary to take a definite yield for each of the crops raised. These are the same for all systems and no attempt is herein made to exhibit phenomenal or impossible results as the yield has been fixed as nearly as possible at the average production per acre for the different crops on the better class of farms of Illinois. Dairy men who have farms less productive, or who for any reason get smaller yields, must scale down the final results in proportion to the crops obtained, and those who can produce greater yields should raise the results proportionally.

Showing Yields of Crops Raised, in Bushels, Pounds and Digestible Nutrients Per Acre.

Crop.	Yield per Acre		Digestible Nutrients.			Total	
	Amount	Lbs.	Prot.	Tot'l Carbo.	Total Fat	Total per crop	
Oats (grain)....	50 bu.	1600	147	757	67	971	
			166		1375	80	1621
Oat straw	1600 lb.	1600	19	618	13	650	
Corn (grain) ...	55 bu.	3080	240	2054	132	2426	
			308		3350	160	3818
Corn stover....	2 T.	4000	68	1296	28	1392	
Timothy hay....	1½ T.	3000		84	1302	42	1428
Clover hay.....	2½ T.	5000		340	1790	85	2215
Alfalfa hay.....	4 T.	8000		880	3168	96	4144
*Pasture				160	585	45	790

From the foregoing table is derived the comparative value of the four systems of cropping from the standpoint of the production of food material for dairy purposes. The table below shows the relative amounts of available digestible nutrients produced by each of the four systems.

System No. 4 produces $2\frac{1}{2}$ times as much as System No. 1.

The total amount of digestible nutrients produced on a 160-acre farm, and available for cows under each of the four systems, after allowing eight acres for roads, yards, etc., is, therefore, as follows:

System.	Protein.	Carbohydrates.	Fat	Total Nutrients
No. 1	26,804	192,460	11,519	230,782
No. 2.	35,024	255,479	14,158	304,661
No. 3.	48,850	296,204	15,143	360,197
No. 4.	80,237	491,249	20,553	592,039

This shows in a striking manner the inefficiency of System No. 1, because of the comparatively large acreage devoted to crops yielding a small amount of nutrients per acre. In striking contrast to this is the great amount of nutrients produced by system No. 4, devoted to corn and alfalfa, the protein being three times, and the total nutrients $2\frac{1}{2}$ times that produced by system No. 1. Systems No. 2 and No. 3 are intermediate between these and show how a dairyman may gradually work his way, by a mere change of cropping, from the first to the fourth system, if a sudden change is thought too radical. System No. 4 requires more labor, but where this can be obtained and used to advantage this system will be increasingly profitable as land becomes higher priced.

The figures here shown do not tell the full story because the poorer rotation will gradually run down the land so that it will produce smaller yields, while with the better rotation, land will tend to increase in producing power, growing larger crops, thereby increasing the pounds of milk and profit per acre, year after year.

Poor Feed Lowers Production: Just Basis.

As the main object is to show approximately the amount of milk produced per acre, under each of the different systems, it is essential that a definite basis of production per cow be used, and for this purpose in all cases there are taken good grade cows, weighing 1100 pounds, that will produce an average of 6,000 pounds of 4 per cent milk a year when well fed on a balanced ration, such as can be produced by systems No. 3 and No. 4. Under system No. 1, cows of this efficiency will produce only

approximately 5,000 pounds of milk in a year when fed on the unpalatable and unbalanced ration, inevitably raised under this system. This is not only because the cows would be in poorer physical condition, but because they would consume less of these feeds. Cows of this efficiency would produce approximately 5,500 pounds of milk in a year when fed on a ration made of feeds raised under system No. 2. It must be borne in mind that in figuring the amount of milk produced per acre under systems No. 1 and No. 2, the cows are in each case charged with only the amount of feed required to produce the less amount of milk, and that the cows are not all fed the same amount of nutrients, regardless of their production.

All Feed on the Farm—Other Conditions.

To put the systems on the same basis, all the feed is produced on the farm, and nothing but milk, old cows, and surplus calves are sold. A good pure bred sire is kept and the herd is made self-sustaining by raising enough heifers from the best cows to keep up the milking stock. As cows will produce, on the average, for six years, this means that one-sixth as many heifers must be raised each year as there are cows in the herd. In the calculations that follow it is figured that the feed for one cow, for one year will be sufficient to raise a heifer from birth to freshening at $2\frac{1}{2}$ years of age.

One-sixth of the cows in the herd are to be sold each year and these would bring an average price of twenty-five dollars. The surplus each, for veal, would number ninety per cent of the cows in the herd minus heifers that must be raised to supply the herd with cows.

Conclusion.

Wonders of increased production have been worked on many dairy farms by getting better cows; and it is here shown that amazing results may also be obtained by following a better system of cropping. It must be remembered that all results in this article are comparative.

The negative amount shown in the profit column of system No. 1 means that if all labor is paid for at market price there would be an indebtedness of \$2.90, besides the miscellaneous expenses incurred in running the farm. Of course a dairyman may be able to make some sort of a bare living by this system, but it is only by having the women and children do part of the work for which they receive no remuneration whatever. There are dairy farms in Illinois conducted in this manner that do not pay 5 per cent interest on the investment, and this is not all, for the farm is continually running down in producing power, so that smaller and smaller yields will be obtained year after year, making this deplorable condition grow gradually worse. System No. 2 has \$772 to meet running expenses, system No. 3 has \$1,936 and system No. 4 has \$3,911, the larger portion of which is profit above interest on the investment, and pay for labor, including the proprietor's at common wages. If, as is likely to be done on more intelligently conducted farms, better methods of breeding were instituted under systems No. 3 and 4, so as to increase the efficiency of the cows, there would be a much larger difference in the total returns than here indicated.

Summary of the Four Systems.

System.	No. 1.	No. 2.	No. 3.	No. 4.
Lbs. digestible protein available	26,804	35,024	48,850	80,237
Lbs. total digestive nutrients available	230,783	304,661	360,197	592,039
Average No. cows kept ..	31.7	42.9	54	84
Total pounds milk produced	158,500	235,950	324,000	504,000
Total value milk produced	\$2,425	\$3,610	\$4,957	\$7,711
Total value of products .	2,627	3,882	5,301	8,246
Left for running expenses and profit	\$2.90	\$772	\$1,936	\$3,911

The above table shows the relative efficiency of the four systems.

To indicate actual tested results as found by the Experiment Station in a full year's record, in each case, six dairy farms of from 151 acres to 350 acres in the Elgin district, carrying from 43 to 80 cows which were much alike in production, yielded the following respective amounts of milk per acre: 994 pounds, 1,137 pounds, 1,341 pounds, 1,412 pounds and 2,145 pounds. Only one of these farms compares favorably with the second best of the four systems described in this address, and it produced about two-thirds as much per acre as the corn and alfalfa system. It must be considered that on these farms large amounts of commercial feeds were purchased.

Member: Tell us how to raise alfalfa.

Prof. Fraser: It is a long story; alfalfa is being successfully raised in several counties in Illinois at the present time; you can grow it if you learn how. You must study the proposition.

Member: Is it good to pasture alfalfa?

Prof. Fraser: It is not a good thing to pasture alfalfa and it is not a safe thing to do.

Member: What do you recommend for pasturing?

Prof. Fraser: The alfalfa will run to blue grass, then pasture it.

Member: What are the difficulties in raising alfalfa?

Prof. Fraser: It is getting a stand. It is tender at first after three or four years it is tough. You must first get the ground clear of weeds—weeds will choke it. Sow at the right time of the year. We sow the last of July or the first of August. We have never lost a stand yet where we sowed it that way and had the ground properly prepared. It takes the use of the land for one year to get a stand.

Member: Does alfalfa grow on sod?

Prof. Fraser: You must have the grass killed out. Alfalfa needs good rich soil to get started.

Member: How about protecting alfalfa during the winter?

Prof. Fraser: The first year only it is necessary; we have no trouble afterwards.

Member: Do you recommend top dressing for protection?

Prof. Fraser: If it is a young yield you are apt to get some weeds in but it should have a stand of eight or ten inches in the fall before it stops growing. That will protect it during the winter.

Member: Where is the best place to get seed?

Prof. Fraser: We use the non-irrigated.

Member: Is seed from Nebraska better?

Prof. Fraser: No; get it as near home as possible.

Member: Do you get a crop the same year you sow?

Prof. Fraser: No.

Member: I got five-eighths of an acre started this fall on my potato ground. The 15th of August it was about a foot high, and I wonder if it will stand the winter.

Prof. Fraser: You must not cut it, leave it. You must arrange to cut so that it can grow eight to ten inches at least. It is such an excellent crop all dairymen ought to learn how to grow it. It is worth as much as bran.

Member: Would your milk test as high?

Prof. Fraser: Yes; there is no difference. This is an important subject.

Member: Do you disk alfalfa?

Prof. Fraser: No, we do not, we use spring tooth harrows. Governor Hoard doesn't think it needs cultivation much. In Illinois and in Wisconsin the blue grass fairly runs it out. If you want to continue alfalfa six or eight years you must cultivate it to keep out the blue grass.

Member: How old must alfalfa be to cultivate it?

Prof. Fraser: It must be large enough to stand cultivation; not the first spring, the second spring cultivate it as much as you can without injuring it.

Member: Do cows fed with alfalfa give a richer milk?

Prof. Fraser: It makes more milk.

Member: Do butter and milk keep as long?

Prof. Fraser: Yes, I think they will. If you are cleanly about milk it will keep just as long as it will on any other feed.

Member: Will the milk have the same proportion of butter fat?

Prof. Fraser: Just the same.

Mr. Newman: Any other questions? We are through then with this subject and I want to thank the Professor.

Of course every year this Association meets somewhere in the State and we will have just these same kind of papers. They are published and our stenographer takes down every paper and you are welcome to these books so far as they go. Any one who will read them we will be very happy to hand them to. The taxpayers pay for them and they belong to you.

Dr. Russell, who comes tonight to talk to us about Tuberculosis, stands at the head of his profession in this country, and that means at the head of the profession in the world. You cannot afford to lose this talk. This is a very important subject. The cattle are at the slaughter house and if you wish you can examine them before they are killed. Just ask to see them and you can examine them all you desire before they are killed.

They will start to kill at 10:00 o'clock. Those that leave here will find cars in front of the Coliseum at 9:30; after that they will run as often as necessary.

Do not forget the program for Thursday afternoon, we shall get back and discuss the question of this post mortem; we shall show here the report of the condition of the results. We shall have a good program for tomorrow afternoon.

I want to thank you for sitting as long as you have this afternoon. The meeting will stand adjourned.



Wednesday Evening, January 18, 1911.

Vice President: We will come to order so that the exercises may begin on time. Tonight we are going to have a quartet of boys that will give us some music.

Vice President: I would like to say that the place for holding the tests tomorrow has been changed. It will not take place in the building north of us, on account of the large number wishing to attend we have found it better to hold it at the Kerber Packing House. This will give every one an opportunity to see how it is done.

I have heard a rumor tonight that some people are afraid of this test, that there is something to be put over some one. The Illinois Dairyman's Association is simply an educative body; this test is done purely to show the farmers how it is done and what the results are. We are not up against any political situation; we want you men to use your own judgment. Report has come that there was a committee to report on this test. It is not so. There is nothing to it. You will go down and see it and hear what Dr. Scott will tell you about the post mortem. We will come back here and you can ask Dr. Scott any questions you may wish to. Do not get scared; educate yourselves, that is what this is done for.

Tonight we have with us one of the most learned men we have in agriculture in this whole country. The Association always tries to bring to communities men that have an exceptional reputation, and I will venture to say, there is no man in any country on the face of the globe that is more able to discuss this with you than is the speaker of this evening.

The State of Wisconsin stands with its University in the front ranks, and the gentleman who comes to us tonight is the director of that Agricultural College. I have the pleasure of introducing to you tonight Dr. Russell, Dean of the University of Wisconsin, who will speak to us.

TUBERCULOSIS IN OUR HERDS.

By

Dr. H. D. Russell, University of Wisconsin.

Mr. Chairman, Ladies and Gentlemen: The question, as I understand it, under discussion for tonight and one which interests this community and this state to an unusual degree is the question of tuberculosis in our herds.

It is, therefore, incumbent upon us to approach this question in a fair and dispassionate manner. There is no necessity for any alarm or misunderstanding on the part of any one. What you want as dairymen, what you want as raisers of live stock, or as consumers of dairy products, is simply to know the facts.

All I shall try to do tonight is to put before you some of the most prominent facts regarding tuberculosis.

There is so much misinformation carried on in the papers at the present time that the rank and file of dairymen are apt to get a wrong understanding of the facts relative to this question of bovine tuberculosis.

We shall deal with facts and if at any time a question arises in your mind that you would like to ask I shall be only too glad to be given the opportunity to answer it.

In the first place, as I said before, there is a great deal of misconception relative to the effects of this disease. The paper tonight makes statements that I would be very glad to take up and discuss if I had that paper before me or if I knew what those statements were, but statements are made of this character, that the tuberculin test produces tuberculosis and that it is the cause of spreading tuberculosis, which is entirely false.

After the use of the tuberculin test for eighteen years in the State of Wisconsin I know what I am talking about. There is not a year but what we test every animal at the University,

not that we expect we have tuberculosis; it is simply a measure of live stock insurance. During the past eighteen years we have not had one single animal that has shown the disturbance; there are no ill effects of any sort, either temporary or permanently with reference to any animal in that herd.

That illustrates only one of many instances which indicates that the application of the tuberculin will not produce tuberculosis. It will not cause disease of any kind. It will not affect their well being even to the extent of disturbing the flow of milk.

Many persons would lead you to believe that this is a scientific fad; that this is a question brought about by the scientists to give them a job.

If you go down tomorrow to the Kerber Packing House and see the actual condition before and after these animals are salughtered, I will leave it to you to answer that question, if it is a fad or not.

Tuberculosis does not arise from any condition of environment; no matter how unsanitary and dirty stables may be, how they may lack proper ventilation, how much you over-feed or under-feed, you cannot produce tuberculosis by these surroundings; but after the tubercular bacilli germ has gotten into your herd these conditions facilitate and hasten the spread of the disease but it cannot produce it, any more than you can grow corn and barley without planting the seed in the soil; that is the characteristic.

You plant that seed in that soil and it does not grow until conditions are favorable; when conditions are favorable you get the natural growth. You plant tubercular bacilli, it is nourished and you have all the proper conditions for nourishment. It grows slowly as most of the contagious diseases do, but it will spread. It may take years to produce the death of that animal and that fact makes us feel the danger of that disease less than other classes of disease. This disease is the same kind that affects other kinds of domestic animals and I think right here is a good place to say a few words as to the relation this

bovine tuberculosis bears to tuberculosis in the human. Sometimes it passes from the bovine to the human, although generally it is from human to human; but we have not time tonight to deal with this important sanitary relation.

The question with you is an economical question. We will lay down this fundamental proposition: Can you afford to let tuberculosis go on without attempting to stamp it out? How does it get into our herd? This disease cannot originate, it is brought into our herd by some germ, and it is introduced into our herd in ninety-five cases out of a hundred by taking in animals that are affected with the seeds of this disease but not advanced far enough so it is noticeable to ordinary inspection.

Under these conditions you buy an animal supposing that animal is healthy; there is no man living that can detect this disease where it is based upon physical symptoms in the earlier stages. We buy and sell these animals in the earlier stages without being able to detect the disease. It makes no difference whether you pay two or three hundred dollars and hire a sire or whether you go and buy a springer for a period of time. It comes in a majority of cases by introducing an animal affected in the earlier stages. It has been true in our own state over and over again. Out of 263 herds I inspected I traced the original in 260 herds to the purchase of animals from outside sources. That has led us in Wisconsin to put upon our Statute Books a law which compels the testing of animals for dairy purposes so with each cow there is a clean bill of health. Could we have gotten that law in the start in Wisconsin? We certainly could not; that law is there because of a campaign of education, not compulsory education but more particularly brought about by the agricultural colleges.

We prepared bulletins and distributed them widely throughout the state; these were illustrated and made as attractive and prepared as thoroughly as possible. What was the result with that kind of a paper campaign? We were getting an appropriation of a thousand dollars a year, and then it came to my mind if we were going to do anything toward putting out this fire

we must use measures that appealed from an economic point of view.

We started in on an economic campaign and brought this matter to the attention of the farmers by doing just what you are going to do tomorrow. By holding these campaigns or meetings throughout the state and letting the farmers see the animals before they were killed and letting them see the actual condition of those animals afterward.

When good fat steers which would have topped the market were killed and the internal organs were found saturated with disease they became convinced, as in no other way, of the gravity of this proposition. What was the result? A change from a paper to a demonstrative campaign.

The first year after this we tested nine thousand, the next year twenty-two thousand, the next year thirty thousand and last year fifty-five thousand, and since the first of January, 1911, there have been twelve hundred and sixty herds tested in the State of Wisconsin, over a hundred herds a day. We shall probably have several thousand animals tested voluntarily as the result of this educational campaign.

Under these conditions the farmer has seen the gravity of this proposition and he has become convinced of the necessity of taking hold of this proposition. You are touching the sensitive nerve and the nerve that runs to our pocketbook and we are responding.

If you can see this from its economical aspect you will take hold of this question for yourselves. How can you tell whether your herds have tuberculosis or not? There is no living way except by the application of the tuberculin test.

With all of the mistakes that have been charged against the tuberculin test and to the fact that it produces disease, yet, in the face of all that, I am willing to stake my reputation that there is no known way superior to the tuberculin test. It does not produce the disease. This test enables you to separate the animals, those which are in the early stages and those which are in the advanced stages of the disease. In the earlier stages, as

I said before, it cannot be recognized by any known physical methods.

Now all animals which respond to the tuberculin test are not necessarily dangerous at the moment, for the tuberculin test picks out these animals in the early stages, long before physical evidences are apparent and long before the animal itself is actually giving off tuberculin. This test enables you to detect those animals which six months from now are going to become dangerous. Suppose it only told you the animals which are in the advanced stage, it would be useless for us to cope with this proposition. Due to the fact that the tuberculin test separates one class from another it becomes possible for you to further prevent the disease spreading in your herd.

If you bring into your herd a pure bred sire which is affected in the earlier stages, it is simply a question of time before that diseased animal imparts this disease to its fellows. If those animals do not occupy the same stalls it would not be as rapid as if they did. After the advanced stages the animals adjacent will become most affected, by drinking out of a common water trough, by licking each other in the pasture. Under such conditions it will spread from one to another until a considerable number become affected. This is the experience of the Wisconsin farmer.

Some years ago one of our short course students went down into the southern part of this state and hired to a man who had one of the finest herds in the state. This young man said to this farmer: "Have you ever tested your herd?" The farmer said: "I do not believe in testing my herd; it is one of these Tommy Rot schemes and I do not take any stock in it." The young man said: "I do; I have seen animals tested for tuberculosis and when they were killed they were found to be in a horrible state. I am satisfied there is something in it. Will you let me test your herd?" The farmer replied: "If you want to I will give you your time and you can spend two days in making the test." He performed the test in that herd and of the sixty in the herd twelve responded. When he brought the record sheet to his

employer and showed him that some of the healthiest of the herd were affected the farmer said: "Those are my very best animals; they are perfectly healthy." The farmer further said: "It is useless for you to say anything more, I will not dispose of those animals."

What did this man do? The matter ran along for three or four years. Some of the animals began to grow thin and not do well; their milk flow began to fall off. This condition progressed rapidly until some of these animals were nothing but skin and bone. They coughed almost incessantly and were finally put out in the back pasture, and the farmer said: "We will shoot those animals and get them out of the road." One of those animals was opened up and in the lungs were found the visible signs. Then he finally called in the city veterinary to make an examination of the herd. This examination was made four or five years after this first examination. In the meantime his herd had grown and he had between fifty and sixty reactors. That is the story which any man can experience. This is only one of many cases where a man deliberately shuts his eyes and says there is nothing in this question of tuberculin testing.

You have only got to follow that policy and that same kind of a story will be told. The only way you can know is by the application of this tuberculin test. If you have it in your herd that is the kind of a history you will have. That comes through the purchase of an animal affected in the earlier stages.

If you take that milk to a creamery, or if you are shipping that milk into Chicago or if it is going the length of this state this problem does obtain, the question is what kind of skim milk do you return. It is the milk of all the animals that contribute to that creamery. Suppose there are a few herds that have gotten that disease and you have not, is not this an opportunity for the introduction of this disease into your herds? It certainly is through the cans in the process of separation and in the cream as well as the skim milk. This is the medium of a still further spread of the disease.

I have in mind two creameries which were close together; one had twenty-five per cent and the other thirty-one per cent of the animals they received the milk from react to the tuberculin test. Young calves reacted. Ordinarily speaking, the young stock does not have it nearly as much as the older ones; it is usually those that are fed on the skim milk. I took twelve calves and placed them in a tuberculin barn and in six months time four were condemned and only fit for fertilizer; the disease had progressed in an unusually short time. Generally it takes from three to four years.

This method of bringing to our farms the diseased cattle is the main way in which the disease is introduced into our herd. When it is once introduced it slowly spreads.

In the early days the breeders were the ones to blame more than any one else, not because the breeders were more prone to the disease but it gave a better opportunity for its distribution.

We got this disease from the older countries; in Wisconsin we got it from New York or Pennsylvania. They in turn got it from Holland and the northwestern part of Europe. You can trace this thing back from time to time, due in every instance directly or indirectly to a previous case of the disease in the cattle.

It is by no means confined to cattle. Hogs are more prone than cattle to this disease; one feeding of infected milk is sufficient to give them this disease. I have known of a bunch of hogs that received one feeding; those hogs were killed inside of fifteen days and we found visible signs of the disease. Hogs fed on skim milk are prone to acquire this disease. This disease is increasing greater among swine than the dairy cattle.

One thing, we cannot use this tuberculin test on hogs. We are, therefore, powerless until those hogs are slaughtered. We find this disease increasing among the hogs and it comes to a great degree from associating with tuberculous cattle. Not only may the diseased organism develop within the system of the animal, but how does it find its way out. It is important that

we know those things, gentlemen. How did our generals in the Civil war handle the enemy? Did they attempt to cover every portion of the enemy? They fortified the lines, the bridges, the roads, the railroads, in order that they could use their artillery to the greatest effect. We, in order to use effective measures, must concentrate our artillery.

The tubercular organism is found in the internal organs of the body, the liver, the lungs, the spleen and even the muscular portions may become infected. That organism goes on, multiplies and develops until those lumps break down and produces pus, in appearance not dissimilar to that you find in a boil, although it is not quite as soft in character. This material, when it is forced into the lungs, produces irritation. It breaks out on the outside, or it works inwardly and that results in a cough and so this material is coughed up just the same as in the case of a human being. The sputum is the danger to the community. The animal, however, the bovine does not expectorate, but it is forced out in the act of coughing and it goes through the animal into the manure and the manure is rich with these germs. The coat of the animal becomes covered with this material and it drops off into the milk.

Then again it may come through the milk itself; where the disease progresses and develops in the body it reaches a point where the lymph glands are affected, the blood vessels and the lymph glands. The milk itself at the time it is drawn may contain the seeds of the disease. So with a child where the milk contains these germs it passes to the child. With a grown-up person there is no danger if they are healthy, but with a baby it is different. Thus it is our duty to see that our milk is free from these organisms.

The problem rests with you whether that milk does or does not contain the seeds of disease which are liable to produce this disease in the child.

You have, therefore, this expulsion, in the cough, in the manure and through the milk supply. In the case of the milk if it is consumed by the animal or by your child the liability of

infection exists. You have the infection of the food box, the watering trough in the barn yard which is visited by other animals and in this way the disease finds its way from one to the other.

As I have said several times, the only way you can cut out this thing is by the application of this system. The simplicity of this test is so great it can be readily applied by any one who has had any experience. The veterinary stands ready at any time to make this test, but the demand is so great that it has become necessary for us to teach students how to handle this thing and become efficient in its use.

There are at the present time hundreds of non-professional students testing our herds in order to detect the presence of this disease.

Your state should take hold of this thing and consider it from the standpoint of the public welfare.

Here is a question you face as stock brokers. Our knowledge has come to us within the last ten or fifteen years. In many states this progressive legislation has been put in force. It encourages the farmers. If they find that tuberculosis does exist, the state steps in and takes care of the infected animal and gives a partial compensation. In our state three-fourths of the value, so if an animal is appraised at \$50.00, the owner will receive \$37.50 and thus lose \$12.50. Will you stop at that \$12.50 and say you will not take hold of this thing because you do not get full value? What is its value? It has no value. If the disease is found to be in the early stages its meat value is unimpaired, but in the later stages it is of no value whatever. Suppose you say you will not do that. What will happen? Your case will be the same as these other cases I have told you of. That disease is going to spread until it may possibly wreck the entire herd.

I know one herd that spread it to sixteen other herds; it spread into Wisconsin, Iowa, Illinois and other states and it drove three men into bankruptcy. This disease had been

brought into every herd by purchasing a few animals from this one herd until they found their whole herd was affected.

Not only is it a loss from a dairy point of view, but when this condition is found out then it becomes absolutely necessary to deal with it. No one would willingly consume the products from animals that you knew were affected. We have found that an ounce of prevention was worth more than a pound of cure, not only in the human family but in the bovine family.

By acquiring this knowledge for yourselves you will find yourselves voluntarily taking hold of the matter for the sake of the herd itself, because you cannot afford to carry your own insurance. You do not carry your own fire insurance. At an expense of a few dollars this mutual fire insurance carries a risk upon a large number of the farms. What about the live stock insurance? All that it requires is the application of two days time, the application of the tuberculin at a small expense compared with the value of the stock. Is it not worth ten or fifteen or even twenty dollars to know whether your herd has this disease or not? The paying out of a small amount of money will enable you to answer that question satisfactorily.

If the tuberculin test is properly applied and you find you do not have this disease, you will experience a sense of relief. If you find you do not have this disease you will run a greater risk when you buy animals and bring them into your herd without testing them. No one should think of doing a thing of this sort. It is almost impossible to buy without picking up this disease.

In the southern part of our state three years ago there were twelve per cent that responded to that test, that has been reduced down so that now on an average not more than two or two and a half per cent are found. We find only very little of the disease. They are taking hold so vigorously, whole counties are having their herds tested and finding only from one to one and a half per cent; ten animals in a thousand.

When we began this campaign in Wisconsin the majority of our dairymen took the same attitude as you do. They were

opposed to this. We have gone on, however, preaching this campaign along the lines of education, showing the people on the Missouri plan and the result has been as I indicated. We find under these conditions instead of being a detriment it has been the source of the greatest profit. There are thousands of dollars coming in on account of what we have been doing.

A man came in the other day with a letter from a Chicago man to buy two hundred head of cattle. He said he had looked around the country. He was offered a herd at a very low price and he went to inspect the herd. He told the man he would take his animals if he would guarantee them to be free from tuberculosis. The test was applied and no response was found. He did not take those animals and you may say that the man made a mistake. There was evidence in his mind that those animals had been plugged, so he decided to come to Wisconsin and make his purchase. He would not buy those animals.

If you plug an animal you cannot get a satisfactory test. Let me tell you something that is well worth knowing. If you apply the test today you inject under the skin the tuberculin, you have got to have this expelled from the animal before you can reinject and get a satisfactory test. You will not get a positive response so every one may be easily misled under these conditions. The only thing you can do is to have the test made under such conditions that there has been no opportunity for plugging.

The way we do when we purchase an animal, we put that animal in a barn separate from the others and allow a safe time to elapse before we apply the tuberculin test; sixty days is a safe time. What is the result? Although we buy animals from the outside we have never had in the eighteen years I have been connected with the college one single case of tuberculosis. The only way is simply by this test. We prevent its entrance in this way.

If there are dairymen here who are interested I think we can consume the time very profitably by asking questions and I will answer them to the best of my knowledge. What is a question in your mind is one that I may not have considered at all.

President: The Professor is here to answer any and all questions; do not be afraid to ask even the simplest ones.

Member: If I had a stable in which tuberculosis animals had been confined, how would you disinfect that stable?

Dr. Russell: That brings up one of the most important questions. If you have gotten tuberculosis the barn itself becomes infected. You must disinfect that barn before it is occupied by another herd, and you have the same conditions that you would have with smallpox or any other contagious disease, the disease is again produced. The only thing you can do in this matter is the same way as in the home, disinfect that building so as to destroy the seeds of this disease. The next question is how can that be done? If your building is tight enough, it is possible to use a gaseous disinfectant, otherwise you must use a liquid disinfectant. There are a wide variety of these disinfectants; most are satisfactory, but they are expensive. My mode of treatment is this: First remove all the loose rubbish, all manure and all material which can be easily removed. Any rotten woodwork must be removed. After this loose material has been removed, then apply to the surface of the soil a wash of a disinfectant made of carbolic acid or corrosive sublimate. 1-1000 of a grain will kill these organisms in one minute's time. This should be applied around where the head of the animal has been most particularly. In the general interior of the barn apply a solution of milk of lime. It is made by taking lime and slacking it and adding sufficient water and straining through a strainer. By using a spray pump it can be applied thoroughly to the walls and ceilings so as to fill in the cracks even. Generally speaking, the floor and stalls will be the points where there is the greatest accumulation. Outside of the barn the best agent is the direct sunlight, if it falls upon it, but if it is covered with manure then it does not destroy. The danger of the pasture infection is small. This is our mode of thorough barn treatment.

Member: Do not cattle tested in the spring and then turned out to pasture sometimes recover?

Dr. Russell: In the human it is curable, but in the bovine and in the hog almost incurable. Tuberculosis will remain for years and years, even though it may be latent, but it will work out when conditions become unfavorable.

Say that five out of twenty react, then you test them again in sixty days and you find three out of twenty react, two have ceased to respond; that is when it has been walled off in the body of the animal. The reaction is due to the fact that the tuberculin is dissembled through the body. If this walling off process has been shut off you would not get a response. You would assume it was a cure, and then if you killed the animal you would find out your mistake. It might go on for months and possibly a year. We find that tuberculosis passes from the latent to the acute form after the animal has dropped her calf.

Member: You referred to a proper test; what is a proper test for the application of tuberculin?

Dr. Russell: The temperature of a human being at normal is 98.6; it fluctuates from one to two degrees higher in the bovine. It is, therefore, impossible for us to rely upon one single temperature. You will find some people have done that and made a mistake and assumed one temperature represented the normal. The temperature of the cow may fluctuate from one hundred to a hundred and one or even a hundred and two. That necessitates the taking of a number of temperatures before you inject the tuberculin; that number should not be less than four at intervals of two hours apart. Let me describe the mode:

I should begin by dinner time, take it at 12:00 noon, at 2:00, 4:00 and 6:00 in the afternoon, make the injection at 8:00 in the evening for the reason that it takes from eight to ten hours after the tuberculin is introduced before there is any response. If you made that injection at noon you would have to be up all night working in the dark. If you made it at 8:00 in the evening you could go to bed and stay until 4:00 o'clock the next morning. There will be no rise for about eight hours

after it is introduced. Take those temperatures again at intervals of every two hours until there is a permanent decline. In the case of a non-reacting animal about one and one-half degrees and in a reacting animal in ten hours it would begin to go higher, perhaps to 105, 106 or even 107 degrees; it would remain there for a while and then it would begin to go down. Of course this takes some experience. For instance, conditions might vary, if you should take a bunch of Jerseys, or, in fact, any cows and take them out and let them take in a large quantity of ice cold water, it would lower their temperature from two to three degrees.

Member: What is your opinion of the ocular test for diagnosing tuberculosis?

Dr. Russell: There have been two or three different kinds of tests. The gentleman speaks of the ocular system which consists of taking a drop and dropping in the eye. Where that test has been applied it has been found to be so sensitive that it is not regarded as satisfactory, but it is as reliable as the subcutaneous test; that test is sometimes applied to hogs.

Member: Is the pasteur vaccine reliable?

Dr. Russell: The manufacturer of tuberculin by the U. S. Government by Mulford, Alexander, Park Davis and others who are interested in this work is all right. There have, however, been instances where this tuberculin that has been made by these proprietary concerns has been found to be impotent. Several years ago a large quantity was found to be of no value. I know of no case within the last two or three years. We use that which we make ourselves, but I have no reason to believe but what the pasteur is as good as these others.

Member: What is your experience of the Bang system of testing reacting animals?

Dr. Russell: The Bang system rests upon this fact, a tubercular animal will drop a calf perfectly healthy. There are

only twenty cases on record where calves have been tubercular at birth; that is the same condition in the human, the child does not have it when it is born—it acquires it. If a calf is free from disease and the mother is not it must be separated from its mother, and must either be fed upon the boiled milk of the mother or the milk of non-reacting animals. This test is of great value if you do not want to kill the animal. I have tried it in a number of herds and it has worked successfully. Suppose you find a large percentage of the animals affected, you can then apply the Bang system if you have a place to keep these calves; after you have built a healthy herd, dispose of the diseased animals. I have tried that system with perfect success. I have had several animals that were worth four or five hundred dollars and in the course of two years we have built up a healthy herd on this diseased foundation.

Member: Does the Bang system aim to cure the cow?

Dr. Russell: There is no known cure for this disease. The one that was accepted in the newspapers a year or two ago was a failure. I know of no method of vaccination which is efficacious.

Member: Do you consider the test absolute? Will they always react in the advanced stages?

Dr. Russell: I do not consider it absolute. I did not say so, but it is far superior to any other method. There are certain conditions when it will not give the correct answer. Occasionally when the animal is in the last stages, the injection of a small quantity will not be sufficient to give you a response. It is like the morphine eater, each time you must have a larger dose, a dose which at the outset is too great. When an animal is in that physical stage that it will not respond the possibilities of taking the disease is very great and any person with experience is likely to be able to detect the disease from the physical appearance. The response is due to the reaction. When the

diseased germ has just been introduced, before it is time for the disease to have been formed, then you will not get a response. The response is due to the reaction. You take into the body of the animal the tubercular baccilli and it will take ten days to get a response. During that period you will not get a response because there is no tubercular system where you can get a sharp response. Where animals have been just exposed but are not actually diseased you will not get a positive reaction.

Member: I have heard it said that in the advanced stages there might be a reaction in less than eight days.

Dr. Russell: Where there is any reason to expect that there is an advanced stage of this disease you can frequently tell in two or three days. I heard a man say he got a response in four hours, but I have never come in contact with anything of the kind.

Member: How much tuberculin do you use on a six-months-old calf?

Dr. Russell: Generally speaking two cubic centimeters to a thousand pounds of live weight; but the matter of dosage is not very important.

Member: When tuberculin is injected into the body does it not hasten the disease?

Dr. Russell: It does not produce any effect. It does not hasten or cause the disease to progress more rapidly than it would otherwise.

Member: Why is it in some instances where the animal has responded that in two months later it will not react?

Dr. Russell: I answered that question a while ago. You must allow a sufficient length of time to elapse between the tests, and you cannot always get a response until after sixty days has

elapsed after the first injection before you repeat the dose. Some animals eliminate faster than others. In our herds we never fail to get a correct result when it is applied to reacting animals after three months' time. It is of more value in the initial use.

Member: How much of a rise in temperature would you regard as a tuberculin reaction?

Dr. Russell: It should be at least two degrees. You are getting into a class of questions that are becoming difficult. It is necessary to know the history of the herd, and, in fact, all the possible data that you can acquire; it assists you greatly. Nine-tenths of the tests are not averages, the averages are the interpretation of the man who makes the test. It is very necessary that you should have full and complete data. So many take one or two temperatures before injection. If an animal ranges from 100 to 103 degrees you might get an average, yet it might have tuberculosis. It is the fault of the way in which you apply the test. Generally speaking, however, the difference should be at least two degrees. Another thing the temperature practically always goes to 104 degrees. In the case of most animals it will go considerably above that.

Member: Suppose your first temperature after the first injection was high, say 105 degrees, would you condemn that animal?

Dr. Russell: I should be much inclined to think that that was not a tuberculous reaction, especially if that was the only animal. I would be less positive if there were other animals. Generally we get two or three temperatures.

Member: What danger do we run in putting this tuberculin in healthy cows?

Dr. Russell: As I said at the outset I do not know of one case where it has produced any trouble in the animals. I know of one case, but it was not the fault of the tuberculin, it was

the fault of the party making the test. They died of blackleg. You might use a foul syringe and have blood poisoning set in; that infection does not come from the tuberculin unless it has been exposed to the air. Never use clouded tuberculin; always have your tuberculin clear.

Member: Do you test once or twice a year?

Dr. Russell: If you have no tuberculosis in your herd see that you do not get any. It is not necessary to test more than once a year, but as a precautionary measure you ought to test once a year. If you find tuberculosis do not let it go a year; make a test every four or six months. Get your herd free from tuberculosis. After you are certain it is free the application need not be made oftener than once a year.

Member: How can you detect the different stages?

Dr. Russell: It is absolutely impossible. The earlier stages will give you just as strong a reaction as the more advanced stages.

Member: How is the ordinary farmer to know whether the test has been properly applied?

Dr. Russell: For the ordinary farmer to inform himself through the bulletins from his experimental station how it ought to be done. If his veterinary doesn't do it in the right way, jack him up.

Member: How can the disease in the skim milk be made harmless?

Dr. Russell: By leaving your skim milk at home. Another way is to heat the skim milk so you kill the germ. Keeping it at a temperature of 140 degrees for ten minutes will kill the germs. In some states the law requires them to pasteurize the skim milk.

Mr. Newman: I believe we have had a good discussion, and I think we will have to call this meeting closed for tonight.

Thursday Forenoon, January 19, 1911.

TUBERCULIN DEMONSTRATION

Conducted by Dr. John Scott of Peoria, Ill., Assisted by Dr. W. W. Welch of Elgin, Ill., and Prof. H. L. Russell of Wisconsin University, Madison, Wisconsin.

The feature for Thursday was the tuberculin demonstration. As an educational feature and a demonstration of the tuberculin test as a means of discovering the presence of tuberculosis in cattle, the Association arranged to have five animals, three reactors and two non-reactors, slaughtered, the test to be conducted in an entirely impartial manner, let the results be what they may.

Dr. John Scott of Peoria, Ill., conducted the test and was assisted by Dr. W. W. Welch of Elgin and Prof. H. D. Russell, Dean of the College of Agriculture, University of Wisconsin. The details of arranging the test and the results are best told in the sworn statement of those who had it in charge:

The Illinois State Dairyman's Association:—I would respectfully report that on January 11th, 1911, I received instructions from your Vice President, Mr. Joseph Newman, of Elgin, to take what steps were necessary to procure five milch cows for your tuberculin test and demonstration, advertised for January 19th, 1911, at Elgin; three of said cows to be those reacting to the test and two to be those which did not react. I accordingly secured a dairy of twenty-four cows and arranged for testing them and to purchase five as per my instructions.

On Thursday, January 12th, I started test, completing said test on January 13th, using Pasteur tuberculin. The following is the report of each cow:

At 7:00 p. m. January 12th, each cow was injected with $2\frac{1}{2}$ c. c. of Pasteur's tuberculin.

No.		Jan. 12, 1911.			Jan. 13, 1911.					
		12 m.	3 p.m.	6 p.m.	6 a.m.	8 a.m.	10 a.m.	12 m.		
1.	Durham Cow.	101.6	104.1	101	101.6	101.4	101.4	101.2	O.	K.
2.	Durham Cow.	101.2	101.6	101.2	102.2	102.4	102.6	103.6	S.	
3.	Durham Cow.	101.4	101.4	101.6	105	105.4	105.6	105.4	X	
4.	Durham Cow.	101.2	101.8	101	102	101.8	102	102	O.	K.
5.	Durham Cow.	102	102	102.4	101.8	101.6	101.4	101.4	O.	K.
6.	Durham Cow.	102	102.2	102	105.2	105.4	105	104	X	
7.	Durham Cow.	101.6	101.2	101.4	102	101.8	101.6	101.6	O.	K.
8.	Durham Cow.	101.4	101.6	102	106.2	105.4	105.4	105.2	X	
9.	Durham Cow.	102.2	102.6	102.4	102	102.4	102	102	O.	K.
10.	Durham Cow.	101.6	102	101.4	105.4	105.4	104.8	103.6	X	
12.	Durham Cow.	101	102.2	102	102.6	102.4	102	101.6	O.	K.
13.	Durham Cow.	101.4	101.4	101.6	102.6	101.6	101.6	101.8	O.	K.
14.	Durham Cow.	101.2	102	101.6	105	105.4	105.4	105	X	
15.	Durham Cow.	101.6	101.6	101.4	104	105	105	105.4	X	
16.	Durham Cow.	101.4	102	101.6	106.2	106.4	105.6	105.4	X	
17.	Durham Cow.	101.4	101.4	101.4	102	101.6	102	102	O.	K.
18.	Durham Cow.	101.2	101.8	102	103.6	105.2	106	106	X	
19.	Durham Cow.	101.2	101.4	101.4	103.8	104.2	105.8	105.8	X	
20.	Durham Cow.	101	102	101	102	102	101.4	101	O.	K.
21.	Durham Cow.	102	101.8	101.6	102	101.6	101.4	101.6	O.	K.
22.	Durham Cow.	101.8	102	101.6	104.2	105.4	104.8	103.6	X	
23.	Durham Cow.	101.6	101.6	101.4	104.8	105	104.8	104.6	X	
24.	Durham cow.	100.6	101.4	101.6	103.8	105.2	105	105	X	
25.	Holstein Heifer	101.4	101.4	101.2	104.6	106	105.6	105.4	X	

O. K.—Passed. S.—Suspicious. X—Reactors.

No. 11. Preliminary temperature was too high for a test.

From the above I selected No. 3, No. 15 and No. 25 for the three that reacted, and No. 5 and No. 13 for the two that did not react, and had these five removed to my own barn on Saturday, January 14th, and from there to the Kerber Packing House the following Wednesday evening and Thursday morning. On Thursday at 10 a. m. about five hundred farmers assembled there to see the animals and examine them, after which they were slaughtered, one at a time. At the time I tested them each animal was plainly marked with her number on her rump with white paint, figures about five inches long, hence it was easy to follow each one by number.

The test from the five as you will note from the first table was:

No.	Jan. 12, 1911.				Jan. 13, 1911.			
	12 m.	3 p.m.	6 p.m.	6 a.m.	8 a.m.	10 a.m.	12 m.	
3. Durham Cow.	101.4	101.4	101.6	105	105.4	105.6	105.4	X
5. Durham Cow.	102	102	102.4	101.6	101.6	101.4	101.4	O. K.
13. Durham Cow.	101.4	101.4	101.6	102.6	101.6	101.6	101.8	O. K.
15. Durham Cow.	101.6	101.6	101.4	104	105	105	105.4	X
25. Holstein Heifer	101.4	101.4	101.2	104.6	106	105.6	105.4	X

No. 25 was the first killed, Dr. John Scott of Peoria, Ill., and Professor Russell of Madison, Wis., conducted the post mortem. On account of the size of the room only about seventy-five farmers could crowd into it, hence as each animal was killed the internal organs were exhibited to those outside and later on at the Coliseum, where Dr. Scott and Dr. Russell explained to about seven hundred dairymen the disease, tuberculosis, and the tuberculin test. The post mortem showed a number of unmistakable lesions in the form of a large tubercular abscess in the liver and slight lesions in the medeistinal glands of cow No. 25.

Cow No. 3 was the next slaughtered, the liver also showing well marked lesions, in the form of a large abscess, very much broken down.

Cow No. 15 when slaughtered revealed numerous tubercular lesions in mesenteric glands.

Cows Nos. 5 and 13, which did not react to the test, were then slaughtered and carefully examined, no lesions of tuberculosis being found.

From the above it will be seen that when a reliable tuberculin is honestly used by one who knows his business and is done in a careful manner, it is the best known method for determining which animal is affected with the disease, tuberculosis.

Respectfully submitted,

W. W. WELCH

Veterinary Surgeon.

Elgin, Ill., Kane County, ss.

W. W. Welch appeared before me this 28th day of February, 1911, and affirmed the above report and statements made therein are true and correct.

E. F. MANN,

Notary Public in and for said County and State.

DR. JOHN SCOTT.

Peoria, Ill., April 25, 1911.

Illinois State Dairymen's Association:

I herewith submit to you my report relative to the tuberculosis post mortem demonstration on cattle held at the Kerber Packing Company plant near the city of Elgin, Ill., in January, 1911, during the annual meeting of your Association, the post mortem being conducted by Prof. Russell of Madison, Wis., Dr. Welch of Elgin, Ill., and myself.

Five cattle were presented for slaughter that had been subjected to the tuberculin test by Dr. Welch, three of which had reacted to the test and two had not. Of the three that reacted, two proved, on post mortem, to have tubercular abscesses of the liver, in one of them a considerable portion of the liver being involved. In the other animal the disease was in the incipient stage but nevertheless a typical case, the mesentery or web of the bowels containing numerous miliary tubercles.

The two animals that had not reacted to the test were then slaughtered, with the object of proving to those present the reliability of the tuberculin test, and to show that where there had been no reaction from the test, there would be no disease, and this was fully demonstrated as both animals were found to be in a perfectly healthy condition.

The result of this demonstration and the findings on post mortem should, it seems to me, prove to any reasonable and fair minded person the value and reliability of the tuberculin test in detecting the presence of the disease in any animal, but more especially in those where the disease is in the incipient or early stage, and where post mortem findings have repeatedly demonstrated that it would be absolutely impossible to diagnose the disease as being present from a physical examination.

JOHN SCOTT,

Assistant State Veterinarian, State of Illinois.

State of Illinois, County of Peoria, ss.

John Scott, who signed the foregoing statement and report of demonstration, appeared before me this April 25, 1911, and made oath that the said statement and report so signed and subscribed by him was true and correct to the best of his knowledge, information and belief.

J. B. WOLFENBARGER,

Notary Public in and for Peoria County, Illinois.



PROFESSOR H. L. RUSSELL.

Madison, Wis., March 8, 1911.

Illinois State Dairymen's Association:

In connection with the report submitted by Dr. Welch, relative to tuberculosis post mortem demonstration held at the Kerber Packing House near the city of Elgin, in January, 1911, I would state that five animals were killed that were reported as having been secured from a herd which had been tested by Dr. Welch, three of the animals having been condemned on the basis of reacting positively to the tuberculin test, two having been slaughtered which did not react. These animals were killed on the killing floor of the Kerber Packing House, but this space was too small to accommodate the crowd, and as each animal was killed, the internal organs, including the pluck and bowels, were removed and carefully examined by Dr. Scott, Dr. Welch and myself. Portions of this viscera were then placed in pails, the pails being numbered to correspond to the animal so numbered, and taken outside of the building where they could be examined more particularly by those in attendance. Owing to the inclemency of the weather, it was deemed advisable to transfer this material to the Coliseum in the city, where further details relative to the diseased tissues and the general subject of tuberculosis and the tuberculin test could be more satisfactorily discussed. In these cases, I affirm that the record of post mortem lesions as detailed by Dr. Scott, is correct, and that two of the animals (Nos. 3 and 25) showed marked liver lesions, while No. 15 was evidently tubercular, but not so well advanced. The other two animals (Nos. 5 and 13) which had failed to react to the test, but were killed for the purpose of checking the results, showed no lesions whatever.

The post mortem was, to my mind, a thoroughly satisfactory demonstration of the value of the tuberculin test to detect the presence of the disease in the animal where the disease was

not sufficiently advanced to permit of its recognition by the use of the ordinary physical means of diagnosis. It should have been a conclusive proof to any fair-minded person of the efficacy and value of the tuberculin test as a diagnosis of this disease in cattle.

H. L. RUSSELL,

Dean of the College of Agriculture of the University of Wisconsin.

Madison, Wis., Dane County, ss.

H. L. Russell, who signed the foregoing statement, appeared before me on this 8th day of March, 1911, and affirmed that the report as signed above was dictated by him, and the statements made by him are to the best of his knowledge and belief true and correct.

IDA HERFURTH,

Notary Public in and for said County and State.

Thursday Afternoon, January 19, 1911.

President: Professor Russell is here prepared to answer any and all questions you may ask him and I hope you will not hesitate to ask about anything you want information on.

Member: Is every M. D. able to make this test?

Professor Russell: The veterinary profession are taught how to do this; certainly they could not do it without being taught. The younger men have had much more opportunity than the older men, but any old practitioner can learn to do it. The veterinary profession are competent as a rule.

Member: From your experience do you consider this test has been carefully taken?

Professor Russell: The record is absolutely indisputable. Neither Dr. Scott or myself saw the animals yet the record showed those animals were affected.

Member: In what way would that first animal infect others?

Professor Russell: It is dangerous when this abscess is broken down. When that stuff gets in a dry condition it can be conveyed from one to another when the particles of manure are dry so that the tuberculin gets on them. It may be taken by hogs, it may find its way into the milk supply and go to the city and infect children, the creamery or cheese factory and go back to farms through skim milk.

Member: Is there danger of transmitting the disease by means of the water bowl in the barn, the individual bowl?

Professor Russell: No; because the water comes up. In the common water trough there is greater danger. That is one of the most serious ways of infection.

I have in mind a case where there was a herd of twelve animals, they were divided into two parts and each six animals kept separate from the other six animals. In one side a tuberculin animal was introduced and every animal on that side acquired the disease and in the other side three out of six had it. They got it from the common drinking trough by this animal drooling into the tank and the others drinking out of the same trough. They can get it even though the animal does not come into direct contact with the other animals.

Member: Suppose your individual bowls are connected with the same pipe?

Prof. Russell: There is an element of danger in that of course.

Member: Suppose we had a herd of twelve and only one reactor. If we killed that one would that prevent the spread of the disease?

Prof. Russell: Yes, by disinfecting the barn and the stall. One of the conditions in which tuberculin test does not give the proper answer is the time between the taking in of the diseased germ and the period of incubation, the disease has not developed. There is a period of a few weeks' time that that animal will not react because there is no tubercular tissue. You let that animal stay until the tuberculosis tissue is there and then you will get a response, therefore my course of action would be this: Suppose you have twenty-five in your herd and find ten react. You take out those ten, yet there is a possibility that some few of the fifteen inhaled the germ. I would retest that herd every three or four months. If I did it now I would retest them in May, that is a sufficient time. If there are any animals which are going to respond you would get them on this test. You see, if you have gotten tuberculosis in your herds it requires the examination and the elimination of the reactors and then a retest a few months later. After you have eradicated the disease a test every year or two is sufficient.

My experience is that an animal that has once showed a sign of tuberculosis is a source of danger at any subsequent time. That virulence of the tubercular germ is so great that the animal once affected has a very slight chance of recovery. Occasionally you get cases where an application of the tuberculin test fails to give a positive response. That may be due to the fact that the disease is being held in abeyance. I know such cases as that where this latent tuberculosis has broken out again so when the test was later used they responded. Where there is once a reaction it becomes a ticklish matter to leave such animals in your herds.

Member: If a cow is tested and reacts, if she is inoculated in from two to four weeks would she react again?

Prof. Russell: No, that is not a sufficient length of time to eliminate the tuberculin that was put in in the first time. That period of time we cannot definitely fix, it varies from thirty to sixty days. I should not advise retesting a herd within sixty days; after sixty days you can retest it with safety. You cannot tell until then that the elimination is complete. When you apply a retest you use a larger dosage.

Member: Is there any way of telling whether a cow has been tested first?

Prof. Russell: None at all. That constitutes one of the most serious difficulties that we have to contend with. There are unscrupulous men in all communities that if they have a tuberculosis animal, they will pump tuberculin into it before they sell it. In Wisconsin we have penitentiary laws against it.

Member: Does this tuberculin have any effect on the quality of milk?

Prof. Russell: None whatever. I have drank milk during the process of testing without knowing the difference. Occasionally where you bring strangers into the barn you may get a

slight variation in the flow. It does not change in quality because the animals are being handled by men with whom they are not familiar.

Member: Do you know of any instance where the test has been properly applied and on the postmortem examination you have not found tissue tuberculosis?

Prof. Russell: I have had two experiences, lesions I could not find, where these tubercular lesions have been found in unusual parts of the body. I had a case a few years ago in one of these public post mortems; there was not the slightest trace. I had as many people as I had today. I was up against it. I could not explain why that tubercular lesion was not found, but in cleaning that animal I got in the middle of the back and inside of one of the vertebrae was one the size of a walnut. That explained the whole thing. Another instance, when we came to skin the animal around the forepart of the leg was found tuberculosis of the bone which showed tuberculosis which ordinarily would have been overlooked. Those cases happen, although rarely. Usually you will find them. This has been tested most carefully by competent persons and an exhaustive examination has been made and in 98 to 99 per cent of the cases the evidence of tubercular lesions have been found and demonstrated.

Member: If any one makes a test irregularly is it a State prison offense?

Prof. Russell: In Wisconsin it is, but not in all the States I believe.

Member: What do you do with your reactors?

Prof. Russell: We give a man one of three options. The animal is appraised, these appraisers being neighboring farmers who have no financial interest in the herd. They are then turned over to the State Veterinary and are sent to the Federal Packing House at Milwaukee, LaCrosse, or the nearest point where

there is one, and are there killed under Federal inspection. If suitable their meat is sold for meat; if not, tanked and condemned and three-fourths of the appraised valuation on the value of \$50.00 per cow returned to them.

Another option if those are beef animals in the best of condition, he can send those animals and take the full beef value. I remember of one instance of where a fat steer sold for \$82.00 where it had a small lesion, that would be the option in case of a beef herd.

The third is the retention of animals in quarantine under the Sanitary Board, breed up a herd on a diseased foundation; cows that are worth three or four hundred dollars. You can get a healthy calf every time if you separate that calf after birth. Feed that calf upon boiled milk of its mother's or other animals. In that way the widest possible latitude is given the farmer to handle this himself.

Member: Is Illinois in danger of getting bad cows from Wisconsin?

Prof. Russell: I presume Wisconsin farmers ship stock to Chicago even if they know they have tuberculosis, but a great proportion is done under the auspices of the State because it is helping the people to get rid of this disease. The majority of the people are honest. Here and there, of course, will be men that are dishonest. There is nothing to prevent it, but the great majority is done under the State auspices. Gentlemen, that is what any State has got to do. It is not a question of politics, it is a question of facing a great proposition and meeting it square. If you will help to clear up this thing the State will stand behind you and share the burden.

Member: Can our State of Illinois do anything as long as the farmers are against it?

Prof. Russell: They are against it in so long as they don't know the facts of the case. Such demonstrations as this we

have today do more to put the farmer right than all of the urging and talking that can be done. My advice would be to carry on this campaign of education. In three years' time if you are not co-operating you are different from what we are. We started in Wisconsin four years ago. Prior to that time we were getting only about a thousand tested a year; the next year we got 20,000, the next year 30,000 and last year 55,000, and, gentlemen, this calendar year in the State of Wisconsin we will have over 100,000 head of cattle voluntarily tested. The first twelve days in January we tested 1,260 head and there are at least ten in a herd. We are 50,000 doses behind; we cannot get it or buy it fast enough. We are getting all the United States Government can furnish us. We have bought 25,000 doses from proprietary concerns in the United States. That is the result of an educated campaign such as this is. If you would carry on this educated campaign you would find your people would rise and respond and would want to take care of it for their own good. I do not believe there is so great a difference between Wisconsin and Illinois. Remove this from politics and get down to bedrock.

Member: What per cent did you find in Wisconsin were affected?

Prof. Russell: When we began five years ago about twelve per cent of all animals. It is less than two per cent now; it is going down. The result shows now that we have gotten practically on top. We have found the worst places and put those fires out. The last Legislature passed a law that no animal can be sold in Wisconsin for breeding or dairy purposes unless a clean bill of health goes with that animal. In a year or two we will be on top of it. Some man will say: "You still have it with you." Have we not got smallpox in spite of the fact of vaccination? Some people will not be vaccinated. It is unwise to have compulsory testing at the present time. The time may come; it will, however, be the biggest mistake you can make. Why? Because the whole system would break down. With our 1,200,-

ooo cows to enforce compulsory testing it would take too many veterinaries. It takes two days to make a test of 150 herds if a veterinary did nothing else, and say there are ten to a herd, you can see how many this would take, so compulsory is entirely out of the question. The way for this to go is for every man to learn how to test his own herd, then he becomes a convert and in no other way will he become one.

We have twenty-three cities that prevent the sale of milk unless it comes from tuberculin cows; in Milwaukee there are some tuberculin ordinances under which they are operating.

Member: Could we not go into Wisconsin from Illinois and buy animals that have not been tested?

Prof. Russell. Yes, if you are a big enough fool to buy untested cattle.

Member: Is a man a bigger fool in Illinois than in Wisconsin?

Prof. Russell: No, neither are honest.

Member: A man told me that he had 70 animals tested and none reacted, so he came to the conclusion that it was a fraud.

Prof. Russell: You cannot go in any old dairy district without finding tuberculosis. The only place you will not find it is in the back countries where there are none of the pure bred and no animals have been brought into that section. Some mountains in Pennsylvania and in Kentucky they have scrubs and you would not find tuberculosis. You go into any old dairy section where they have been breeding up their herds, Jerseys, Holsteins, etc., and you will find tuberculosis. Tuberculosis is no respecter of persons, whether beef or dairy. We have more in dairy than in beef; it is because of the greater opportunity of the development of the disease has been present. In the human in certain sections of the city among the people who live indoors are more

susceptible to tuberculosis. They have been exposed to more of it. The dairy animals are more likely to have it than animals in the open.

Member: Have you any law in Wisconsin prohibiting the sending of infected animals from Illinois into Wisconsin?

Prof. Russell: We have learned that trick. We have stopped that so far as possible with legislation. If you will tackle that proposition to make the railroads also responsible for carrying that stock without a clean bill of health and have every railroad pay the fines for disobeying that law it will help this along to a wonderful extent. It is not done as much as it was because many of the railroads have had to pay the penalty. You say, how can you clean it up? By preventing more from coming in. You must not have Illinois a dumping ground for Wisconsin or any other state. You must not let them come in unless they can give you a tuberculin certificate, unless they come in to be slaughtered. If you do you are going to get tuberculosis as sure as the sun will shine tomorrow.

Member: How near the time of freshening can you make a test?

Prof. Russell: It can be applied to within a few days of calving. The physical process of calving is such a strain she is liable to fluctuations. Again, the test should never be applied when an animal shows a feverish condition prior to the injection, the test should never be carried on.

Member: Did our committee on investigation come up to see you for information or write you, the Legislative Committee I mean?

Prof. Russell: I cannot answer that question. I recall no correspondence. It is barely possible I did receive a letter last year from some one of the State Live Stock Commissioners asking some questions, but no committee has ever visited us to

secure any information as to how this work was handled in Wisconsin.

Member: Salvation comes to the man who helps himself sometimes.

Prof. Russell: My experience is that there is only one answer. I have not seen a bunch of men, no matter how much they were opposed to this, where they have calmly set and thought this out and seen these animals before and after injection, but what they have not become convinced there was something in it. This method is so far superior to any other method that, personally, I am willing to trust to this method in preference to anything else. The Milwaukee Ordinance, which has been confirmed in every case all over the United States, the universal testimony in every court is that the tuberculin test was the most reasonable and sensible way that was ever devised. The Supreme Court of Wisconsin confirmed that decision last week.

Member: Our committee has reported the state of Illinois prohibit making such laws.

Prof. Russell: I do not see on what basis such a report was made.

Member: At what stage of the disease does the cow infect the milk?

Prof. Russell: Whenever there is visible tuberculosis of the udder, the milk under such stages contains tubercular organisms. I have a case where one teaspoonful injected in the guinea pigs killed those animals in four weeks. Don't misunderstand, all animals that react actually deliver tuberculosis germs; they do not. Only five per cent have tubercular affected udders. There are a small amount of animals that deliver it through the milk; the manure is often the cause of affecting the milk supply. Any open case of tuberculosis might affect

the milk supply. I do not want to tire you in regard to this matter, but I am willing to continue it as long as you are interested. Any other questions?

Member: The tuberculin test would not cause the cow to lose her calf only through the shock; that is why you do not use the tuberculin test just before, is it not?

Prof. Russell: I have never had a case where the tuberculin test has produced any undesirable result. I have known of some instances, but in my experience it has not been true.

Member: I know a man who lost two-thirds of his calves from animals that were tested.

Prof. Russell: If you test all of your animals you could not tell whether it was contagious abortion or not; sometimes it runs through the whole herd and you cannot control it. It might in your case be contagious abortion.

Member: If this milk was boiled from the reacting animal would it be harmful?

Prof. Russell: If you boil the milk and keep it to a temperature of 140 degrees or higher for ten minutes it will kill all the tubercular bacilli and this renders the milk perfectly harmless.

Member: In the eastern states after using the tuberculin test they have abandoned it as impracticable.

Prof. Russell: Tell me where.

Member: In New York, in Boston and in England.

Prof. Russell: New York first passed a compulsory law about ten years ago. They started on Cape Cod; they tested their animals, and what was the result? There was no public sentiment behind the law; they spent over three-quarters of a

million dollars in two years' time and then they finally wiped the law off the statute books. They have done nothing since. You must first have a campaign of education. Their mistakes fifteen years ago led us to adopt a middle of the road policy, so gradually we have gone forward with a campaign of education before a campaign of compulsion. If we had followed Massachusetts or New York we would be in the same condition they are in today.

Member: We tried that fifteen years ago.

Prof. Russell: The law is no good unless you have a public sentiment behind it. You can only enforce a law when you have public sentiment behind it.

Member: Have you ever had any bad effects from an over-dose?

Prof. Russell: Any variation within a hundred per cent I have never found to have a bad effect. Where you use a re-test we employ a double dose if that test is given within six months.

President: There must be some other questions.

Mr. Walker: Do you know how the matter of vaccine is against tuberculosis?

Prof. Russell: At the present time there is no method that is beyond the experimental stage. My experience has been that it did not prevent the development; that it actually gave animals tuberculosis that did not have tuberculosis before. I might say, however, there may be developed a system of vaccine which may be of some service. The above vaccine is used as an experimental proposition.

Mr. Newman: Just to give you a chance to rest I want to come before you as a tax payer. This is your test; it is your

money that is used in conducting it as tax payers. I would like to ask you if you approve of this practical work, or would you prefer to have papers read.

The Illinois State Dairymen's Association gives you this test without costing you tax payers but a trifle; possibly this work of yesterday and today will cost you five cents. Do you consider this work of sufficient importance to ask the Legislature to be generous with us? I make that as a motion.

The motion upon being duly seconded was carried.

President: Mr. Newman, I want to thank you and the gentlemen here for the support you have given me. Some of my best friends thought it was a mistake to have had it but as it will not add one cent to the expenses of this meeting and only cost you a trifle in taxes I wanted to make the experiment. While I have tried to do what I could in this section and in this state I wanted to know if I was working in the right direction or whether you wanted simply fine talk and language or whether you really wanted this work, and I thank you for the support you have given it.

Are there any more questions?

Member: If you have an animal in a warm barn and take it out will that produce tuberculosis?

Prof. Russell: Gentlemen, I answered that same question last night, but for the benefit of those that were not here last night I will answer it again. The cause of tuberculosis is this tiny organism which is always present in a case of tuberculosis. You cannot introduce tuberculosis without that germ. The rate at which the disease develops may be influenced by the environment, any condition which tends to lower the vitality. It requires in every case the association of the diseased organism before a case of tuberculosis can be produced. That may come from direct contact and it may come from indirect contact, where a barn is infected with tubercular animals and they are taken out and another bunch brought in, the diseased germ may

be there. The same condition of things obtain, these are living germs; they have the same law that governs man.

Member: Is a person liable to get tuberculosis by catching cold?

Prof. Russell: No person acquires tuberculosis by catching cold unless the tubercular organism is in the system at the time. Tuberculosis is the most frightful malady we have, one-seventh of the human race die from this and one-third between the ages of fifteen and forty-five die of this disease. Proper care must be taken of the sputum. Probably everyone takes in tubercular organisms but the resisting powers of our body help us to throw it off. If you catch a cold that diseased condition lowers the vitality of the body so that at that particular time the tubercular organism may get into our systems, therefore you do find following a long cold comes the development of tuberculosis which would not have developed had not the person caught that cold at that time.

Member: If you have not tubercular organism in your herd, if your cattle do catch cold they would not acquire the disease? You say climatic conditions will not originate the disease; is it beneficial to go to some other warmer climate?

Prof. Russell: It used to be considered necessary to go to New Mexico, California or some other warm climate. That is the worst thing you can do if you have got tuberculosis. Why? Because in the first place generally the person dispose of all they have got to go there, so they are not able to leave under favorable conditions. Second, you associate with persons who have that disease, and third, it is not necessary. One can be helped in Illinois just as well as he can be in California. Moreover, if you do affect a cure in one climate you must remain in that climate in order to keep that cure. The modern mode is to remain in the same climate in which you contracted the disease. There are many places right around here that you can go to to be helped, Ottawa, Illinois; Wales, Wisconsin, etc. You will find

persons living outdoors; they are day by day being healed of tuberculosis under these conditions. It is possible in the early stages for a cure to be effected so far as the running of the disease is concerned. If the person would lead the right kind of a life the chances are he will not die of tuberculosis. I know scores of people who are apparently well men, just as healthy as I am.

Member: Can we cure it in the cow?

Prof. Russell: No; the cow is so much more susceptible than the human. You take a human and a bovine strain unchecked, thus in mice, calves or monkeys, and you will find in every case the bovine strain will produce a much worse type than the human.

Member: Will the application of the tuberculin test cause any ill effects on a healthy animal? And by drinking the milk of a healthy animal where the tuberculin test has been applied will it cause any ill effects upon the person drinking that milk?

Prof. Russell: Absolutely none at all.

Member: What is the best time of the year to make the test?

Prof. Russell: In the winter or the cool months of the year. Why? Because the conditions are better in the cool months than in the summer and because during those months those animals are in the barn most of the day. In the winter the animals are under normal conditions. When the animals are used to the grass they are nervous or excited, therefore the great bulk of our testing is done between October and May.

President: I do not know how we can thank Professor Russell for this most interesting talk. I see in the faces about me that we have enjoyed this very much.

We have some business that we must take up.

At this point I would like the Chairman of the Resolution Committee to come up here and give us his report.

Mr. Newman: For this great work Dr. Russell has done for us today and yesterday I move that we all rise and thank the Doctor for his great work that he has given us today.

President: That is unanimous; some are standing on chairs.

Prof. Russell: I assure you it is just as much a pleasure for me to be here as it is for you to have me. If there is anything I can do south of the border line it will be done as willingly as the north.



RESOLUTIONS COMMITTEE REPORT.

President: We will hear from Judge Lynch now.

Judge Lynch: We first wish to recognize and here give testimony to the fact that this, the Thirty-Seventh Annual Convention of the Illinois State Dairyman's Association, is the greatest in the history of the Association.

The meeting has been gratifying in every particular, in attendance, in interest manifested, in the program and discussions and in all the practical demonstration work arranged in the different lines of the industries.

The success of the Convention is due to united effort on the part of citizens of Elgin, and officers of the Association, and the officers and members of the Association wish here to express this gratitude.

We wish to thank the Mayor, the Elgin Commercial Club and citizens for their work and interest in the affairs of the Association. We wish to thank the Elks Club for their entertainment of members, and many courtesies extended to the officers of the Association who freely used the club rooms for committee meetings.

We thank dairymen who, with their exhibits of splendid specimens of dairy breeds, added much to the success of the meeting. These exhibitors are: E. W. Wing and J. L. Mason of Elgin, James Dorsey of Gilberts, T. E. Getzelman of Hampshire, Robert E. Haeger of Algonquin, and Frank Hopp of Elgin.

We wish to especially thank Dr. W. W. Welch of Elgin who arranged the cattle exhibit at the Convention and participated in arrangements for the tuberculosis demonstration. Also the Kerber Packing Company where the demonstration took place, and complete and satisfactory arrangements and for courtesies extended to all present at the demonstration.

Among the speakers we wish especially to thank Dean Russell of the Wisconsin College of Agriculture for assisting us in the tuberculosis demonstration and explaining its results.

We wish to thank the Elgin High School for its exhibit, the High School Glee Club for music furnished.

We wish to thank all who took part on the program for able address on important dairy subjects. We feel that these subjects have been presented in a manner that must bring good to the dairy interests of our state.

Our thanks are due to N. W. Hepburn, in charge of the Dairy Manufacturing, University of Illinois, and Fred Jorgensen of the same department for their work in charge of the butter exhibit, the butter and milk testing contests and the class in butter judging. These practical features have made this Convention particularly valuable to all who have taken part in them. We thank O. A. Storvick, of the Dairy Division, U. S. Department of Agriculture, and Fred Bockleman with Coyne Bros., Chicago, who assisted in scoring the butter.

We wish to thank the supply men who have added materially to the appearance and success of the Convention.

We thank the Elgin Daily Newspapers, the "News" and "Courier," for their splendid accounts of the proceedings of this Convention, and their liberal use of space prior to the Convention so as to give it the widest publicity in their territories.

United effort has made this Convention a success and we hope that all who had a part in this effort feel as gratified with the results as do the officers and members of this Association.

BOVINE TUBERCULOSIS.

WHEREAS, Bovine Tuberculosis, in many of the older states, has spread to such an extent in many herds as to threaten the health and usefulness of dairy cattle and be a menace to the future dairy industry; and

WHEREAS, From such existing conditions the great dairy breeding interests of the State of Illinois may be seriously injured and damaged by failure to use proper precautions;

THEREFORE, BE IT RESOLVED, That we recommend that such action be taken as will protect the breeders from

becoming the victims of such conditions and guarantee that all animals imported for breeding purposes shall be only received in the State when accompanied by a certificate from a reliable source, showing such animal to be free from tuberculosis after applying the most approved method of giving the test known to modern science, the tuberculin test.

BE IT FURTHER RESOLVED, That we feel the great importance to every owner of dairy cattle in this State, of having his herd healthy and strong and especially free from tuberculosis; and we therefore recommend that each individual owner of dairy cattle, for his own interests, and the interests of those with whom he may deal, take such necessary action to eradicate the same, if his herd is affected; and give such care to his herd as will effectually prevent its inoculation.

LIVE STOCK COMMISSIONERS.

BE IT RESOLVED, That this Association earnestly endorse the work of the Illinois State Board of Live Stock Commissioners for their efficient, courageous and able manner of treating and handling the various diseases of live stock; and we call attention to the fact that such desirable results have been attained by reason of the character and ability of the officers in whom have been vested the power and responsibility.

BE IT FURTHER RESOLVED, That it is the sense of this Association that said Commission should be vested with power and have full control of all live stock matters, and should have sufficient funds to fully protect the interests of all the people, and sufficient employees to carry out all necessary laws and regulations.

PURE FOOD COMMISSIONER.

BE IT RESOLVED, That this Association endorse and commend the faithful performance of duty of the State Pure Food Commissioner, the Assistant Commissioner and their employees.

We recommend that ample and sufficient amendments be made to the law, to prevent the sale of combination dairy feeds that are not honestly labeled as to the constituents entering into the same.

We further recommend that sufficient appropriation be made to the Pure Food Department to enable the employment of all necessary additional inspectors to enforce the law.

And we recommend that there be no limitation as to the number of such inspectors as may be assigned to the enforcement of the law in relation to dairy products and laws relating to dairy interests.

COW TEST ASSOCIATION.

RESOLVED, That as steps have been taken toward establishing one or more cow test associations in the state, we express the hope that the movement will be carried forward to success, and the forming of these associations be started in Illinois.

We recognize the value of these associations in the knowledge they bring to their members of which are profitable and which are unprofitable cows, and the small cost at which such knowledge is furnished through such associations.

NATIONAL OLEOMARGARINE LAW.

WHEREAS, The Oleomargarine interests are willing to agree to any kind of a Bill so long as it permits color to be used in oleomargarine, and are now working for a Bill with the idea of uniform 2c tax on colored or uncolored;

BE IT RESOLVED, That we pledge our support to the present 10c tax law as the best protection we now have against the fraudulent selling of oleomargarine for butter, and will work with the National Dairy Union to secure amendments to the present law that will compel the sellers of oleomargarine as such and prevents its sale as butter. Under present conditions the butter market and the whole dairy industry are suffering

because, while only three per cent of oleomargarine manufactured pays the 10c tax, fully ninety per cent of it reaches the consumer and is sold to him as butter.
the same.

JOHN LYNCH,

E. W. WING,

O. V. FOX,

Committee on Resolutions.

President: You have heard the reading of the Resolutions, what is your pleasure, the adoption of these Resolutions as read? Are there any suggestions that you would like to make, if not, they stand approved.

BUTTER SCORES—OTHER CONTEST RESULTS.

The Secretary has a few announcements to make before we proceed with our program.

Secretary: I just want to announce the winners in the various contests.

SIXTY ENTRIES OF BUTTER.

Following are scores of 89 and over:

CREAMERY CLASS.

Name.	Address.	Score.
O. W. Annis,	Big Rock	93 1-2
Geo. Bloyer,	Harper	93 1-3
Fred J. Weddige,	Big Rock	93 1-3
C. W. Swateck,	Cherry Valley	93 1-3
R. H. Means,	Miles, Iowa	93.16
Roscoe Barber,	Forreston	93.16
P. W. Virgin,	Belvidere	93.16
F. Grimm,	Crete	93.16

J. Ducharme, Davis	93
Wm. Bramstadt, Mascoutah	93
A. M. Ross, Irene	93
F. G. Irons, Welton, Iowa	92.16
L. Phillips, Allerton	89.83
A. Maule, Round Grove	92.5
C. E. Mortensen, Milledgeville	90.16
E. T. Moore, St. Joseph	91.66
W. L. Curliss, Barry	89.66
Farina Creamery Co., Farina	91.33
M. Simonson, Manhattan	89.66
H. O. Henry, Beecher City	89.5
Petersen Bros., Galva	89
M. Jensen, Flora	92.66
O. W. Hicks, Guernsey, Iowa	92.5
G. W. Hoppensteadt, Goodenow	91 1-3
P. J. Petersen, Round Lake	92.83
K. B. Carpenter, Mt. Carroll	91.5
F. Grimm, Savanna	91
Wm. Englebrecht, Mt. Carroll	90.5
G. A. Cutler, Belvidere	92 1-3
Huntley Dairy Co., Chicago	90.83
C. M. Dooley, Pecatonica	91.16
L. R. Wecherly, Dakota	91.66
H. L. Moore, Strasburg	91.83
W. L. Richards, Parkersburg	90
Robert Moren, Freeport	92.16
Geo. Deandorff, Amboy	89.83
M. L. Musselman, Lanark	91
A. J. Negus, Preston, Iowa	91
A. A. Adams, Harvard	92.5
L. Neillsen, Camp Point	89.83
L. H. Knigge, McHenry	92
C. Long, Belvidere	92.16
A. J. Spohn, Morrison	90.5
L. Johnson, Stewardson	90.66

DAIRY CLASS.

Name.	Address.	Score.
Chas. Foss,	Cedarville	92.5
C. D. Ettinger,	Finley Park	92
L. E. Macky,	Marengo	90
E. J. Mattson,	Morrison	90
R. H. Pennington,	Plainfield	88.87
C. D. Bartlett,	Wheaton	88 1-3
J. Basieur,	Marengo	86.83

BUTTER JUDGING CONTEST.

First—E. T. Moore, St. Joseph, Ill.

Second—Geo. Bloyer, Harper, Ill.

Third—Chas. Foss, Cedarville, Ill.

Fourth—H. Harneman, Watseka, Ill.

Fifth—F. J. Weddige, Big Rock, Ill.

Sixth—Robert Moren, Freeport, Ill.

Total number of contestants was ten.

MILK TESTING CONTEST, JAN. 19.

L. R. Wecherly,	Dakota	100
D. W. Annis,	Big Rock	99
Geo. Bloyer,	Harper	99
Louis Nielsen,	Camp Point	98
C. Stocker,	Highland	97
E. T. Moore,	St. Joseph	95
D. R. Dumet,	Virgil	88
F. J. Weddige,	Big Rock	80

J. P. MASON, ELGIN.

President: Any further resolutions? We have a telegram from Judge Lindley stating that owing to the health of his wife he was unable to come. She was not well and he had to take her to Florida. Mr. Mason pleads illness, but I think if you will call on him he would say something. You are wanted at the front, Mr. Mason. You can give Mr. Mason some of these questions about feeding dairy cows, etc.

Mr. Mason: Mr. President, Fellow Farmers:—I think if I make a speech here I shall feel like the man who said his speech ought to be run through the separator, for I am quite sure that will be the same way with mine.

It is appropriate that the annual meeting should be held here, the greatest dairy center. There is no place where there are finer animals than in this section; good farms, good cows, good crops and good water. There is no section where better milk is produced than around this Fox River Valley, and for all that we have good markets, and we have dairymen in this section that could show that their annual output is from \$55.00 to \$140.00 under some conditions, some markets, yet it looks as though there was a chance for a vast improvement.

It has been thirty-three years since we had a meeting here. I found that program the other day, and on that program there are two men that are here today, one was Mr. D. E. Wood and the other myself.

I believe in running a dairy for profit. There are no better dairymen than are in this section. They cannot all be good dairymen, some never know what their annual output is. We used to think that if we got a can of milk from three cows we were doing well. There are dairymen who get one can from two cows and some get less. I can show you a dairyman whose milk will bring more in one month than others will in a year, and that herd cost less than \$75.00 per cow. It is up to you to

get cows that will pay you. You go to your best dairymen and find out what they are feeding their cows, clover hay or alfalfa. I do not care how good the cow is the good dairyman must go with her. Many times you find a man who is a good farmer but not a god dairyman. You must have the two to make a success. Another phase, you must finance this to make a success. Some of the very best farmers of every community fall down because they do not know how to finance their business. We grow alfalfa when it does well. It is one of the best things for ensilage and the animals will take all they can get. There has been some complaint about the labor of filling these silos. You take these modern improvements and it settles the question of filling the silo. It picks up all of the ears that are scattered and you can do more with the teams and the men will not be striking. We drive up and throw the bundles. That is the most economical way to handle the corn crop. In this way it is all eaten. They thrive on the clover and alfalfa hay; it makes nearly a balanced ration.

I came to the conclusion thirty years ago that it was up to every man to lessen the cost of production even if it took united effort to raise the price. There are men that produce for half what it costs others to produce the same thing. There is a chance for improvement right here. The dairy farm is no more or less than a manufacturing plant. The details of dairying are your working capital, the object is the same as the manufacturing business, to make that working capital pay the largest amount possible as well as to add to its value in the way of soil fertility. The soil is sensitive to the touch the same as your dairy cow responds with good care and a balanced ration. We must raise larger crops to the acre. We do not raise nearly what we ought on this land. You take corn, only 35 bushels, it ought to be more than double. There is no market that will pay as high a price for the feed as the dairy cow; that is the highest market. In this dairy business the market does not fluctuate as it does in the beef.

At one time I quit dairying and raised beef cattle and I

want to show you the difference. In one year there was a fluctuation of \$4,500.00; in the dairy business it is gradual. For every day you feed a steer and he does not gain in weight, that is one day's feed thrown away. I went back to dairying and the difference in fluctuation was only \$250.00, and you had your working capital left. None of us have reached the highest amount that we can get from our cows. I can see that plainly.

There is a dairyman about here who gets twenty cans of milk from thirty-six cows. I have never known a man to do better. He certainly does the best of any man I know. That will bring him in between \$2,500 and \$2,600 this month. We have other young men coming to the front, too. I want to pay them what honor I can; they stand at the top. Take these Cook Brothers, they are on the very top, and there are ten or fifteen others that I have in mind that honor the business. Others are content to milk four cows to produce a can of milk. You must make more profit; it is just the same as the manufacturing business.

I know three farmers, one figures that the man's wages a can of milk cost him 50c, another 26c, and still another 20c. That is a difference of 30c on labor alone. On the amount I produce it would make \$15.00 difference, or \$450.00 a month. It is worth looking into. There is nothing that will put a dairyman on his feet quicker than to know what he is doing, what it costs to run a dairy farm and what your expenses and profits are. Compare one year or one month with another, there is nothing that will help you more.

We want to bring these crops to a higher yield. We ought to have a 100 bushels to the acre. You can do it if you try.

I know one dairy where they are making 170 pounds per cow; another dairy in DuPage County where the best cow in the dairy brought in \$197.00 in making butter, the butter sold for 22½c. The poorest cow brought in \$97.00, I think. That is about double what the average cow produces, the poorest one.

I do not know that I can tell you anything more. Those are

the lines we ought to work on. We ought to have our calves from a pure bred sire; the calf must be well raised and well fed.

We want to show these young men that there is something in farming. You take a good farm; well tilled, growing a good crop and feeding it to well bred animals and I do not know where there is a business more attractive or where the possibilities are greater. It is like the atmosphere, it is always with us. There are just as many possibilities as ever.

This dairy meeting has been a great success, and we appreciate what you have done for us. The success is largely due to Mr. Joseph Newman, who is the man who has done much of the work. I thank you.

President: This will close our program. If there is nothing else in your minds, we will adjourn the 37th Annual Illinois State Dairymen's Association.



ALFALFA—THE SEED BED AND SEEDING.

ByH. D. Hughes, Iowa State College.

Alfalfa can be grown successfully on nearly all Iowa soils, providing that proper methods are followed. The fact that a few men have not succeeded with the crop in their first attempt should not discourage any, as the percent of failures is probably not much greater than the percent of failures in securing a stand of crops with which we are thoroughly familiar, such as red clover, timothy, etc. Inquiries recently made by the Iowa State College indicate that alfalfa is producing large yields of hay of the finest quality on almost every soil in the state.

Alfalfa has been successfully grown on the College farm and on the Experiment Station fields for a number of years. Two fields which are still in alfalfa this season may be mentioned as indicative of what may reasonably be expected.

On the College dairy farm a field of $7\frac{1}{2}$ acres was seeded in August, 1908. In 1909 and again in 1910 three cuttings were made with a total yield of $5\frac{1}{2}$ tons per acre each year. In 1910 the field also gave considerable pasturage. This season the first crop was cut on June 12th with an average yield of $2\frac{3}{4}$ tons per acre for the whole piece.

A plot on the farm crops experimental fields, seeded August 18, 1908, gave three cuttings with 5.25 tons per acre in 1909, three cuttings with 5.15 tons per acre in 1910, and the first cutting this year gave 2.25 tons per acre, of field cured hay.

During the past season a number of farmers have been conducting co-operative experiments with the Iowa experiment station in order to determine what methods should be employed in order to secure the best results. These men are located in almost every section of the state, and dealt with all sorts of soil

conditions, yet wherever the most approved methods were followed, without exception, excellent stands were secured and the yields thus far this season have been very satisfactory. While the results of these tests, together with other alfalfa investigations are reported in a bulletin soon to be issued by the station, they may be briefly stated here for the benefit of those who contemplate putting in alfalfa this fall.

Soil.

Because of the large and very rapid growth made by the alfalfa plant, it is essential that it shall have a large supply of readily available fertility. It is necessary therefore that alfalfa should be seeded on soil rather above the average for the best results. Much good corn land when properly handled, will grow alfalfa successfully, providing that it is well drained and sweet.

Drainage.

It is useless and unwise to attempt to grow alfalfa on land which is not thoroughly well drained, either naturally or by the use of tile or ditches. Some of the best results have been secured on bottom lands as these are likely to be quite fertile, but no matter how much available fertility is present, an attempt to grow alfalfa without good drainage is almost sure to result in failure.

Many fertile upland soils are not suitable for alfalfa growing owing to the presence, too near the surface, of a compact, tenacious subsoil so impervious to water as to prevent proper drainage.

Manure.

While good stands and yields of alfalfa have frequently been secured on fertile soils without the aid of manure, yet these yields are in almost every case largely increased by it. On soils which are only medium in fertility, manure is essential to success, and on soils below the average in fertility, successful stands



Holstein—Friesian—Tina Clay DeKol, 57350 (University of Illinois.)

	Lbs. Milk.	Lbs. Fat.
1st Lactation period, 365 days	11024	382
2nd Lactation period, 365 days	11366	360
3rd Lactation period, 365 days	11562	377
4th Lactation period, 365 days	14685	442
5th Lactation period, 365 days	13459	433

are practically never secured without its liberal use. The use of manure is by far the most important factor in securing successful results with alfalfa on Iowa soils.

Preparation of the Seed Bed.

To insure the best possible stand of alfalfa, the land chosen for the crop should be plowed in the spring following the application of the manure, and worked down into good condition at once. The field should then be harrowed or disked at least every two weeks in order to insure germinating and killing as many of the weed seeds present as possible, and also to conserve the moisture.

It is not necessary, however, to give up an entire season to securing a stand, though this is the surest method. Manure may be applied and the land plowed immediately following the cutting of winter wheat, or first year crop of red clover or oats cut early for hay. When this treatment has been given as soon following the removal of the crop as possible, it has almost never failed to give good results, even though the summer be rather dry.

The necessity of thoroughness in this preparation, however, cannot be over emphasized. Unless the land is prepared early in the summer and then a good mulch maintained, there will be great danger of an insufficient supply of moisture to insure germination. Then again alfalfa will not fight weeds, and unless the soil is stirred often, in this way bringing the weed seeds to the surface and germinating them before the alfalfa crop is put in, difficulty and possible failure is the result. Further, while the surface soil should be very well fined and loose the substance should be rather compact. Late and insufficient preparation means a loose seed bed with more drying out, and then in the winter great danger from heaving, with the loss of the whole crop as a result.

The Use of Lime.

If the soil is at all acid, to grow alfalfa it will be necessary to apply from 1,000 to 2,500 pounds of lime per acre. The

poorer and more worn soils are most likely to be acid, in which case the use of lime is essential. Even on the more fertile soils its use has usually resulted in a more vigorous and healthy growth. Lime in the form of fine ground raw limestone is much to be preferred, owing to its cheapness as well as to its effect upon the soil. The soil may readily be tested for acidity by taking thoroughly moistened soil from a few inches below the surface and pressing it, as into a ball, about a piece of blue litmus paper. If after ten or fifteen minutes the paper is found to have changed to a distinctly pink color, one may be reasonably sure that the soil needs lime. Otherwise lime is probably not needed. Litmus paper can be secured at almost any drug store.

Inoculation.

.. The results of numerous and wider tests indicate that most of our soils probably contain the alfalfa bacteria which are essential for continued success with this crop. While these bacteria are probably not present in so large quantities as could be desired, their rapid multiplication is apparently much aided by a liberal use of manure.

On soils which do not naturally contain these bacteria it is absolutely essential that they be introduced. This inoculation may best be secured as follows:

Just before seeding, scatter uniformly on the piece, from 150 to 300 pounds per acre of soil secured from a field where alfalfa has grown vigorously and where the plants produced in abundance tubercles on their roots. Where this is not to be had, soil from a sweet clover patch may be used.

This soil should not be exposed to the sun any more than necessary, and may well be applied toward evening and harrowed in thoroughly at once as the direct rays of the sun soon kill the bacteria.

As there is no way of determining whether these bacteria are present in a given soil without attempting to grow alfalfa, the only safe way is to inoculate; since if they are not present

failure is almost certain. A small area may be seeded and inoculated the first year, from which soil may be secured for larger areas in following seasons.

Seeding.

Seeding of alfalfa should best be done from the 10th to 20th of August, though success may be had from seeding a few days later than this, provided that other conditions are favorable. The other seeding is, however, to be preferred, providing there is a sufficient amount of moisture in the soil to germinate the seed.

The seed should by all means be put in with a drill when this is at all possible, and should be placed from $\frac{3}{4}$ to $1\frac{1}{2}$ inches below the surface. In order to get the most uniform stand it is often advisable to go over the field twice, putting in one-half of the seed each time and crossing the field the second time over. If it is impossible to secure a drill the seed may be applied broadcast and harrowed in well, or even disked in. This may well be done toward evening when any moisture in the surface soil will help to secure germination.

Seed.

Only seed that is of the best quality should be used. Most seed companies handle several grades, varying much in quality, purity and germination. Samples and prices may well be secured from several seed companies, and then the best selected. The College stands ready at all times to test free of cost any samples of seed for impurities and germination.

In order that farmers may know from personal experience something of the possibilities of this crop, several of the larger seed companies have offered, at the suggestion of the College, to supply at reduced prices enough seed for one acre (20 lbs.) This seed will be furnished in these small amounts at a little below the rate usually asked for it when ordered in larger quantities. Any person ordering more than twenty pounds will pay the regular market price for the balance. Farmers taking

advantage of this special offer should indicate this to the company from which ordered, to insure that the desired quality of seed will be sent. This seed has been examined by the College and is known to be the very best.

Co-Operative Test.

The College is now planning to undertake a few more co-operative tests this fall in certain sections of the state, in order more fully to represent all soil and climatic conditions. An outline of this experiment and full information regarding it will be sent upon request to those interested. While all cannot be accommodated under this arrangement, the outline will no doubt be helpful in indicating ways of determining the treatment necessary for the best results, on any particular soil.



THE PLASTERED OR GURLER SILO.

By

H. E. McNatt, University of Missouri.

One of the most successful types of silos is that generally known as the "plastered" or Gurler silo. It is built much like a frame house, except that it is round in form, with a lining of boards running lengthwise around it, somewhat like the hoops of a barrel which give it strength to resist the immense pressure of the silage. Its cement plastered wall protects the wood framework from decay.

Some of the strong points in favor of this style of silo are:

1. Can be built entirely from ordinary lumber.
2. Requires no highly skilled labor for its construction.
3. Preserves the silage as well as any type of silo in use.
4. Is strong and durable when properly made.

Size of Silos.

Generally speaking, it is not advisable to build any silo more than sixteen feet in diameter. It is better to have two small silos than one too large for the herd. The best proportions are: Height about twice the inside diameter.

Laying Out Foundation.

A short stake is driven firmly into the ground at the point selected for the center of the silo. To the top of this is secured, with a single nail a horizontal piece of light, stiff lumber, bearing upon one end an arm sharpened so as to scratch a circle on the ground when moved around the center post. This circle marks the outside limit of the silo foundation and care should be taken to get the measurements correct.

Digging the Pit.

With the circle as a guide a pit is dug to a depth of from two to three feet. The wall of dirt is cut plumb and the floor leveled.

Form for Foundation.

The foundation is reinforced concrete. The frames which hold the form boards in place, which are made of one-by-four plank, should be placed thirty inches apart around the pit to hold the inside and outside form boards in place. These boards are half-inch lumber of four-inch width, so as to be readily bent to conform to the wall of the pit. The distance between the inside form boards and the pit wall should be one foot. The concrete foundation should extend about one foot above ground on the outside. The upper corners of the concrete wall are beveled after the concrete has become sufficiently stiff to permit this being done. The two-by-four sill with a large spike for an anchor is imbedded in the top of the wall. The concrete should be made from clean, sharp sand and enough Portland cement to insure a strong mixture. The proportions will run about as follows: 1 part cement, $2\frac{1}{2}$ parts sand, and 5 parts of broken stone. Enough water is added during the mixing, which must be thoroughly done, to make a mixture that is thin enough to settle to the form with light tamping, but not so thin as to carry the cement out through the cracks of the form by the water leaking out. The foundation is reinforced with a piece of three foot woven wire fencing placed in the center of the form before filling with the concrete mixture.

After the wall has set sufficiently to stand alone, the forms may be removed and the floor laid to a depth of four inches. It is advisable, but not absolutely necessary, to pack about four inches of wet cinders in the bottom of the pit before laying the floor. Before the wall and floor have hardened, a finishing coat of sand and cement mixed three-to-one should be put on with a plasterer's trowel.

The sill at the top of the foundation is made of two-by-four lumber cut into two foot lengths. Each piece is put in place while the concrete is soft and anchored by three heavy spike nails with turned points, or thin bolts with nuts and washers on their ends. This anchoring is necessary, and ties the woodwork of the silo firmly to the concrete.

Erecting the Studding.

The studs are made of two lengths of two-by-four lumber spiked together at the middle and are erected two feet apart. If the diameter and height of the silo are more than about sixteen feet by thirty-two feet, it is advisable to either use two-by-six lumber or set the studding only eighteen inches apart. Two pieces of two-by-four lumber spiked together to make a four-by-four is used as a center pole to tie the studding to while they are being set up. Each separate stud is toe-nailed to the center of a section of the sill. Only the lower half of the studding is put up first, the second piece being spiked on after the lower half of the silo is nearly complete and needs no bracing. The studding is plumbed with a carpenter's level and tied in position temporarily with small scraps of old lumber.

Putting On the Sheeting.

When the lower half of the studding has been tied in position, the sheeting, which is one-half inch lumber made by ripping one-by-four or one-by-six lumber, is nailed horizontally on the inside of the studding, taking care to break joints. The sheeting should be nailed on from the foundation to within about a yard of the top of the studding, and then the lath put on.

The Lath.

Although somewhat expensive, the sheet steel, or expanded steel lathing found on the market, is the best for the purpose. But ordinarily the same material as the sheeting ripped into inch and one-half widths and beveled on the edges is used.

These are nailed on top of the sheeting, so as to break joints, covering cracks whenever possible, and leaving a suitable space for clinching the mortar.

The Upper Half.

When the sheeting and lath have been put on to within about a yard of the top of the first length of studding, a temporary platform or trestle may be laid to enable the workmen to erect the second half in the same manner as the first was put up. It is well to leave the center pole resting on the concrete floor and extend it by adding another piece.

The second half of the studding should be spiked to the first with a lap of about two feet. After blumbing and tying in place, the sheeting and lath are put on, and finally after removing the temporary platform, the middle is completed by putting on the sheeting and lath. Care must be taken that no wide cracks are left.

Plastering.

The wall of the silo is plastered to a depth of about one inch, i. e., about one-half inch over the lath, with a rich, well-mixed mortar or concrete, made from three parts of sharp, clean, coarse sand, or finely crushed stone, and one part of good Portland cement. This mortar should be about as thick as that ordinarily used in plastering a house.

The Doors.

Four doors are sufficient for a thirty-foot silo, and five are enough for a thirty-six foot silo. Ordinarily the bottom of the first door will come about two and a half feet above the sill. The doors are two and one-half feet high and four feet are allowed between doors.

When the studding is being spliced for the erection of the upper half of the silo, care must be taken that the studding between which the doors are to come are not lapped but are put end to end and tied together with a six-foot piece of two-by-four spiked to each at the junction. This allows a door jamb which

is simply another two-by-four set back from the inside edge of the stud an inch and a half and either well spiked or bolted in place. The upper and lower jambs of the door are made from short lengths of two-by-four spiked across at the proper places.

The doors themselves are made from flooring boards nailed and screwed together at right angles, with a sheet or two of tar paper between.

In fitting the doors before filling the silo, a layer of tar paper or heavy building paper should be put between the jambs and the doors. The doors are held in place by heavy bolts, fitted with large nuts and washers, passing through them and through pieces of two-by-sixes laid across the opening on the outside of the silo. Two cross-pieces are needed; one near the bottom, the other near the top of the door.

When this point in the construction of the silo is reached, although not completed, it may be filled if it is necessary to do so.

Siding.

Although somewhat expensive, galvanized sheet metal makes a good siding. Probably the most practical plan, however, is to put on some hoops and nail ordinary boxing lumber to them. The hoops are made of three thicknesses of the sheeting lumber put around the outside of the silo every four feet, being careful not to cross doors. One thickness is put on at a time. The joints must break to insure strength. The boxing lumber is put on vertically and nailed to the hoops. The cracks are covered with ordinary weather strip.

The Roof.

A plate similar to the lower sill is put around the top of the silo on top of the studding. The roof is usually made in the same manner as the roof of a house except the rafters are put up in conical form, and no joists are put in. The roof boards are put on in short lengths, and shingles or some other

good roofing material put on top. A properly made door must be left in the roof through which to fill the silo.

Ventilating the Walls.

When the silo is covered on the outside in any way other than with hoops and vertical boxing, it is necessary to bore a large auger hole between each stud on the outside at the bottom and on the inside at the top so as to allow the air to circulate through the wall and keep down decay of the woodwork. All holes should be covered with fine mesh woven to keep rats and mice out.

When hoops and vertical boxing are used, a few large sawed holes about four-by-six inches in size, at the bottom and top will serve, since the air can readily pass between the boxing and the studding.

Bracing.

It is necessary to anchor the silo firmly with three or four strong guy wires or cables of short length. These are very valuable in case of windstorms. They are attached to sleepers buried several feet in the ground about four or five feet out from the base of the silo, and run to a point on the studding about half way to the top of the silo, where they are firmly secured.



THE REINFORCED CONCRETE SILO

By

F. H. Demaree, Acting Agronomist, Missouri College of Agriculture.

Silage is coming into more general use every year and the concrete silo as a means of preserving green feed has become very popular. The popularity of this silo is well founded since it is durable, efficient, fire and vermin proof, and the cost is not excessive.

Size of Silo.

The size of the silo which is practical to build will depend upon the number of animals to be fed and the length of the feeding period. It is necessary to feed two inches or more of silage daily from the top after feeding has begun in order that it may not spoil. This being true, careful attention to size is essential in order to save feed after it has once been secured. The diameter of the silo should depend upon the number of animals to be fed while the height will depend upon the length of the feeding season. The latter will of course vary with the locality.

The following table will aid in determining the size to build both in diameter and height:

TABLE NO. I.—Showing Size and Capacity of Silo for Herds of Various Sizes.

Feed for 180 days			
No. of Cows	Diameter	Height	Capacity—Tons
7-10	10 feet	25 feet	36
10-12	10 feet	28 feet	42
12-15	11 feet	29 feet	60
15-20	12 feet	32 feet	73
20-25	13 feet	33 feet	83
25-30	14 feet	34 feet	115
30-35	15 feet	34 feet	131
35-40	16 feet	35 feet	158
40-45	20 feet	35 feet	258

Making the Forms.

After having decided upon the size of silo needed the next thing is to secure forms for the construction of the walls. If the forms of correct size can be hired in the neighborhood or from a distance it will be advisable to secure them rather than to go to the trouble of making them. If not, the cost of making is not excessive. They are fairly simple and can always be hired out or sold for enough to repay the cost of construction.

The forms can be most easily made in six sections each. To mark out patterns observe the following: Clean off a large space on a barn floor, then select a long piece of straight stripping at least 20 feet in length. Nail to the floor at any convenient place and from the center of the nail measure out on the strip the exact distance of the radius of the silo to be built. Drive a nail through the stripping here so that the point will scratch. If the wall is to be six inches thick measure from the center of this nail six inches farther and drive another nail so

that it will scratch. Strike a long arc with the two nails. Now take a fine wire, tie a pencil or piece of chalk to one end and measure it the exact length of the inside radius of the silo. Select any point on the inside curve, mark it with chalk, then strike a point on this same curve as far as the string will reach from the point selected. This will mark off a part of the circle equal to $\frac{1}{6}$ of the circumference of the silo. The enclosed segment of the circle so described may be divided exactly in half by laying a straight board from the two points designated, measuring exactly half the distance and projecting the line from the center of the circle through the middle point of the board described. From these two points measure back toward the center four inches inside the first circle and eight inches beyond the outer circle. Now take a plank ten feet by eight inches and one inch thick, saw exactly in the middle. Nail lightly to the floor and with the scratching nails, scratch out the curves. This will make one pattern each for the inner and outer forms. Since the patterns are only half large enough for a full section, two of them must be nailed together in order to make the full length. The strips to be used in holding the two parts of the section together should be at least four feet long and cut on the same circle as the form.

The forms should be at least three feet high so that it will take six pieces from the pattern to build each section of the form. This will mean thirty-six of the inner and thirty-six of the outer patterns. When cleated together three will be used to make each section. In order to make the skeleton of the form a strip of heavy wood at least one inch thick and two inches wide and three feet long should be mortised into the three patterns every fifteen inches apart. The outer stick on each end of each form should be of 2x4 material. Cover each section with a heavy strip of sheet iron or with matched lumber running up and down. Any other bracing may be put between the patterns that is found necessary. The patterns are all sawed in the radial line leading to the center so that they will fit in a circle.

Building the Foundation.

Locate the silo at a place convenient to the barn. This will generally be within three or four feet of one end, or some door close to the mangers. Level off the ground, and with a string and nail mark out the circumference of the silo with a radius at least one foot longer than the inner radius of the silo. Excavate within the circle at least four feet, keeping the dirt around the outer edge perpendicular. The foundation wall should be at least one foot thick to properly support a concrete silo, so as soon as the excavation is finished mark off another circle the exact size of the inner diameter of the silo, using the same center as above. Drive heavy stakes so that their outer edge will be exactly on the line of this circle completely around it and about two feet apart. The tops of these stakes should extend as high as the level of the highest part of the ground around it. Brace each stake from the middle so that it can not give. Bend on half inch planks around the outside of these stakes making an improvised inner form leaving the earth for the outer.

The foundation should then be made of concrete, using crushed stone or very coarse gravel as the base of the mixture. The mixture recommended for the walls may also be used here. Care should be taken not to fill the concrete more than a foot in depth around at one time and this should be thoroughly tamped and worked with the spade until water stands on top, then allowed to set before an additional layer is added. The foundation should also be reinforced by steel rods which may be bought for the purpose or by twisting together three or four strands of number 12 cable wires and laying them a foot apart as the foundation goes up. A spirit level should be used in order to get the foundation form at the same height and level all the way around.

When the walls of the silo are complete the bottom should be laid. Put down a well-tamped layer of cinders or gravel about six inches deep and upon this put six inches of concrete. Plaster the surface about one-half inch deep with the same mixture used in smoothing down the walls.

Erecting the Walls.

As soon as the foundation is finished the forms should be set in place and the construction of the walls begun. The thickness of the wall should be at least six inches and the forms described have been made for this thickness. In setting up forms no specific directions can be given for the erection of staging. If the builder is uncertain as to how best to keep the forms suspended he should employ a carpenter for a day until the staging is erected. It is safer to use scaffolding both on the inside and outside to support the form. When in place the sections are bolted together. This holds them rigid. The first section of the wall will of course be built with the forms resting on the foundation, the inner one being barely on the inner edge of the foundation so that the inside wall of the silo will be perpendicular from the bottom up. As soon as the forms are in place and leveled, fill with concrete. Tamp the concrete well and work with a flat spade, especially next to the sheet iron on both forms, until the water rises on top. As soon as level full the concrete must be left to set at least twenty-four hours. The forms may then be unbolted and raised. In building up the wall continual care must be exercised to keep it perpendicular. In order to accomplish this, do not raise the form to its full height but allow it to lap back on the solid concrete at least six inches at the bottom. Block and tackle of some description is used in raising the sections and in hoisting cement. Each time the form is raised grease the sheet iron surfaces with axle grease or soap before filling to prevent the concrete from sticking to the forms.

The walls should also be reinforced at least every foot by means of steel rods which are laid horizontally inside the form or by twisted wire as previously described. This is a good place for old barb wire.

When the forms are removed each time the inner and outer surfaces should be smoothed down with a board. This will be sufficient for the outside, but when the silo is completed the inner surface should be washed with a thin coat made by mixing one

part cement and one part fine sand. This may be applied with a whitewash brush. Keep the sun out and wet the inside once or twice a day for a week. This makes a smooth and lasting inner surface.

Mixing the Concrete.

The mixture which is practical to use in building a concrete silo is one part cement, two parts sand, to four parts crushed rock or very coarse gravel. In mixing it is best to have a fairly accurate measure such as a wheelbarrow which will hold so many shovels or by counting the shovels of sand, gravel and cement used. The best way to thoroughly mix material is to have prepared a well jointed mixing-board, then dump convenient quantities of sand on the board. Put on the right amount of cement and thoroughly mix with hoe or shovel. Put enough water on to make this sloppy, then dump on the gravel or crushed stone and turn at least twice with the shovel. The mixture is then ready to use.

TABLE NO. II.—Material Necessary for Concrete.

Ht. Silo Feet	Inside Diam. Feet	Thickness Wall—Inches	Cement— Bags	Sand— Cubic Yards	Gravel or Stone —Cubic Yards
20	8	6	34	2¾	5¾
20	12	6	55	4¼	8½
20	15	6	73	5½	11
25	10	6	54	4	8¼
25	15	6	86	6½	13
25	20	6	122	9¼	18½
30	10	7	73	5½	11¼
30	15	7	115	8½	17¼
30	20	7	154	11¾	23½
40	15	8	159	12	24¼
40	20	8	220	16½	33¼
40	25	8	283	21½	44

Doors and Openings.

Openings must be left on the side of the silo next the barn. They should be placed no more than four feet apart, a convenient size being $2 \times 2\frac{1}{2}$ feet inside measurements, the longer way up and down. The form is constructed so as to leave a shoulder on the inner edge of the opening which is two inches deep with a one inch jam. Reinforce each doorway with twisted wire completely around the opening to prevent splitting.

The doors to fit into these depressions should be made double of one inch matched lumber and stripped along the edges with tarred paper or felt in order to make air-tight joints. Generally the doors are set in place allowing the pressure of the silage to hold them. They may be bolted in place, however, by running a long bolt through the center of the door and a cross piece outside the opening holding to the outer edges of the silo. When in place the inner surface of the doors is flush with the inner surface of the walls.

A ladder leading up into the silo is necessary. To attach one to a concrete silo it is a good plan to set bolts a few feet apart on each side of the door openings as the wall is being built. Turn the bolts before the concrete sets completely so they may be removed and the ladder attached to them.

A Simple Roof.

Silos should have a roof to protect the silage after feeding has begun. It is not necessary for the preservation of the feed before. Throw up rafters to the middle making a conical roof, and shingle. Leave a trap door in the roof for the pipe when filling.

FILLING THE SILO

By

Prof. Kennedy, of Iowa Experiment Station.

A timely bulletin on a subject in which all buttermakers are interested as advisers of their patrons is on filling the silo. It comes from the Iowa station and was prepared by Prof. W. J. Kennedy. He treats the subject under different headings as follows:

The problem of filling the silo for the first time is going to confront more farmers this year than ever before. Thousands of men are asking these questions: When should the corn be cut? What length should the corn be cut? Should the silo be filled rapidly or slowly? How should the corn be distributed and packed? Should water be added during the filling? How should the cracks or other air spaces be filled? What is the best way to prevent waste on the top of the silo? What does it cost per ton to fill the silo? How soon after filling is the silage fit to use?

In attempting to answer some of these questions the author, in addition to drawing upon his own personal experience of many years with silos, has consulted all of the leading experiment station workers, who have had silo experience, and in addition many of the leading beef producers and dairymen. The answers brought out many points of interest. Chief among them was a marked tendency on the part of the beef producers to advocate a more mature corn at filling time than in the case of the dairymen.

Time to Cut Corn.

While there is some slight difference of opinion on this matter, practically every answer indicated that the corn should

be dented, in the dough stage or when about one-fourth the husks and lower leaves were turning brown in color. This would indicate that the best results are obtained when the corn is mature enough to cut for shocking purposes. The nearer the corn is to maturity the more food nutrients it contains. Thus the more valuable from a silage standpoint, providing there is enough moisture to insure proper fermentation. Immature corn makes a dark colored silage which may cause animals to scour badly.

In the discussion of the lengths in which the corn should be cut when put into the silo, much difference of opinion was manifested. Some advocate $1\frac{1}{4}$ inches, others 1 inch, others $\frac{3}{4}$ inch, many $\frac{1}{2}$ inch, while some advocated less than $\frac{1}{2}$ inch. The longer the cut used the more economical from the standpoint of power and the more rapid the filling of the silo. The shorter cut such as the $\frac{1}{2}$ inch length insures less waste in feeding the silage and makes it possible to put a greater quantity of corn in the silo. Taking everything into consideration, either the $\frac{1}{2}$ inch or the $\frac{3}{4}$ inch cut should be used. This will make a very palatable form of silage for the animal, and also make it easier to pack the silage so as to eliminate the air, thus preventing waste.

RAPID OR SLOW FILLING.

This is a point on which there is much difference of opinion. Where slow filling is practiced it is always possible to pack the silage thoroughly by tramping and allowing it to settle.

In this way the full capacity of the silo may be utilized. The objections to this system are that where a large quantity of silage is to be put up on a farm or on several farms with the one filling outfit, it takes so much time that some of the corn must be put in too green at the beginning and some more of it too dry at the finish. It is also more expensive than where rapid filling is practiced.

Where rapid filling is practiced, say from 80 to 100 tons per day, the cost of filling is reduced to the minimum. A large quan-

tity of corn can be put in the silo in a short time, thus insuring a more uniform quality of silage. The chief objection to this method is, unless provision is made for refilling in about a week or ten days time, that after the corn is thoroughly settled in the silo it will only be about two-thirds full. This may be partially overcome on a farm where two or more silos are built side by side by filling one for a day, then the other, allowing some time for the corn to settle until the two or more silos are filled. In some instances where about three days are required for the filling, the work is commenced on Friday and Saturday, allowing the corn to settle over Sunday, and the work is finished on Monday. Where fast filling is practiced the only way to utilize the full capacity of the silo is to fill to the top, let it settle for a week or ten days, remove the waste on the top of the silo, then refill. This requires a resetting of the machinery when used by more than one farmer, but it will pay.

Distributing and Packing Corn.

There are several different ways for distributing and packing the corn in the silo. The principal points to be observed are that the light and heavy portions of the corn should be uniformly distributed. That is, the stalks and ears should not be in the center or at one side and the lighter portions such as the leaves at the other side. The corn should be uniformly packed or tramped in all parts of the silo. This is necessary to insure a good quality of silage. The majority of the silo owners prefer having the surface of the silage saucer shaped, about two feet higher at the sides than in the center, for the reason that the center where the corn drops and the men usually stand gets solid and hard and does not settle afterwards as much as the sides. (This is especially true of those silos filled without some form of a distributing device.) If the sides are constantly kept about two feet higher than the center and well trod or tramped when the silo is full, the silage is wedged tightly against the sides and the heat of fermentation retained, thus killing the germs of mold. One reason why silage molds more at the sides than in the

center is that it is not packed closely enough against the sides to prevent the air from reaching the heated silage, thus furnishing mold-making conditions.

There are several patented distributing devices on the market. The majority of these are very helpful in filling the silo. A very simple and cheap device may be made by sewing together a number of sacks (with the ends cut out) making a tube. This is attached to the end of the blow pipe and manipulated by a man inside of the silo. In this way the corn can be evenly distributed over the entire surface of the silo. The packing of the corn is an important point. True, in time, it will settle of its own accord, but more corn can be put in a silo and much better silage made when the packing is given careful attention. Tramping on the part of the men is helpful. The best way, however, is to use two good, reliable men with cement tampers. The best silage the writer has ever seen was in a silo which had been packed by cement tampers. There was not a particle of waste after a few inches on the top had been removed.

Adding Water During Filling.

Ordinarily corn cut at the proper time does not need any water added to make good silage. There are times, however, when it is necessary to add water to the corn in filling the silo. The corn in the silo at the time of filling should feel moist; if not moist, water should be added. Under any of the following conditions water should be added to the corn when filling the silo: First, when the corn is too ripe, and the leaves and part of the stalks are dried out to such an extent that they will not pack well. Second, when the corn is severely frozen before it has reached the proper degree of maturity, liberating the moisture and leaving the leaves and stems dry. Third, when refilling the silo late in the fall with shocked corn it is always necessary to add water.

There are two ways to add the water. First, put a hose in the silo and thoroughly saturate the dry portions, especially

around the walls. Second, where the blower cutter is used, run an inch stream of water into the blower when it is at work. This will add a sufficient amount of water to insure good results.

Filling Cracks and Air Spaces.

The silo should be air tight. Any crack or space which lets in the air will cause more or less moldy silage. These troubles in wooden silos may be avoided at filling time by having a pail of soft clay at hand; as the silo is filled up anything that looks as though it was not air-tight should be filled with a handful of clay. Any cracks or openings in masonry silos should be properly fixed with cement before filling. Great care should be taken to have the door fit well and air-tight. In a good silo, properly filled, there should be no waste except at the top.

Preventing waste on Top.

There is always some waste on the top of the silo, unless feeding operations are commenced as soon as the silo is filled. The amount of waste material varies under different conditions of management from two inches, where great care is exercised, to ten or twelve inches, where practically no precautions are taken to protect the same. Various methods for lessening the amount of waste have been tried out. One of the first precautions is to thoroughly pack and level the top of the silo. Some use oat chaff or cut straw. Others thoroughly soak the top with water, then seed with oats. The oats germinate and form a thick covering which serves to keep out the air, thus lessening the waste. One of the easiest and most satisfactory methods to pursue is to pick the ears of the last three or four loads of corn, then run the stalks through the cutter into the silo. Thoroughly tramp the same. Then put on from twenty to thirty barrels of water. This has the effect of hermetically sealing the silo and only a very thin layer of waste will be on top.

Cost Per Ton of Filling.

The cost of filling the silo (cutting the corn in the field, hauling it, putting it through the silage cutter, tramping, leveling and covering the silo) varies from 40c to \$1.00 per ton. It depends on many factors. First, the distance the corn must be hauled from field to silo. Second, the kind of weather, as it will cost about fifty per cent more to fill a silo during wet and broken weather than during dry, clear weather. Third, the kind of machinery used. The cutter must be a strong, well-built machine with a wide feed mouth, because at times it is put to very severe tests. The motor power must be ample; a fifteen-horse power engine is much more satisfactory than a ten where rapid filling is practiced. Fourth, a well organized crew of men will fill a silo much cheaper than where organization is lacking. The machinery should be kept going at full blast all of the time.

The following statement, furnished by a very successful dairy farmer, gives a fair idea of the cost of filling the silo: "We hire an extra man or two and make long days with the regular help during the filling season. We have our own outfit, silo cutter and engine (16-horse gasoline), also corn binder. We use our regular low-wheel, flat rack wagons and have two pitchers in the field and let one of them take the herdsman's wagon for the first few loads in the morning and the last few at night.

Four teams and drivers	\$16.00
Corn binder, man and team	10.00
Cutter and engine with one man	15.00
Two extra men to pitch	5.00
Two men in the silo	5.00
Thirty gallons of gasoline	3.60
Total cost per day	\$54.60

"This crew will put in from 85 to 90 tons per day, thus it costs around 60 to 65 cents per ton to fill the silo."

The above statement is a fair one. It has cost from 60 to 75 cents per ton to fill the silos at the Iowa experiment station during the past eight years. The higher cost was due to hauling a long distance or to rainy weather when the loading was more difficult and the sand and dirt on the corn made it very difficult to keep the knives on the cutter in good working condition.

When to Open Silo.

The corn may be used for feeding purposes as soon as the silo is filled. For the first few days it will be simply cut corn, as it is not silage until it has gone through the heating process. In a week or ten days' time the real silage will be reached. When managed in this way there is no waste on the top of the silo. If allowed to stand for several weeks there will be some waste in the form of decayed corn. This should be removed and hauled to the field in a manure spreader, as it is not always a safe feed for any class of live stock.



MAKING GOOD EARTH ROADS.

ByH. C. Ramsower, Ohio State University.

When the subject of good roads is mentioned now-a-days, one immediately gets the impression that the modern macadam, costing from \$2,000 to \$8,000 per mile, is the only road that can come within the meaning of the term. This is not the case. If such were true, the vast majority of people would not have opportunity to enjoy the boon of a "good road," on account of the lack of public funds.

According to the State Highway Commissioner, there are in the State of Ohio 88,861 miles of public highways. Of this amount, 14,188 miles are gravel roads, 9,687 miles macadam, and 231 miles brick-paved. This leaves 64,755 miles of roads, or 72 per cent of the total mileage, to be classed as unimproved or dirt roads. The writer is an enthusiastic believer in the modern macadam road, but this bulletin is intended to show that good roads can be made of gravel or dirt alone, and it is to the improvement of this 72 per cent of our state highways that we need to give more time and attention.

Water is the best friend and the worst enemy of the country road; a friend, in that the roadbed can never become compacted without it; an enemy, in that those detestable mud holes and ruts are the direct result of its action. With the former effect we need not be concerned, but to the latter we must give serious attention.

It has been well said that the ideal road is one with a good roof and a dry cellar. These two features, a roof to shed the water falling upon the road and to prevent it from standing upon the surface or sinking into the roadbed, and a drain to prevent hillside or seepage water from working up underneath

the road, are essential; it makes little difference of what material the roadbed is made, a good driveway will be assured.

A good roof must be secured by proper grading. This grading should be done in the spring, for then the earth is soft and easily moved; the summer's travel will pack it firmly, making it resistant to the effects of water and frost. The familiar wheel-grader, pulled by either horses or a traction engine, and so directed that the dirt from the sides of the road is gradually worked up into the center, is the most effective tool for the purpose. We have all, no doubt, seen grading done where sticks, stones, sod and trash of all kinds were shoved up into the middle of the road and left there in the vain hope that it would all wear down into a smooth and solid surface. All such trash should be hauled to a place where it will at least do no harm, for if allowed to stand in the road, most of it will find its way back into the ditches and obstruct the flow of water. A roadbed cannot be made out of sod.

There must be a gentle slope from the middle to each side of the road, not so steep as to cause inconvenience to one driving out to one side with a load, but just steep enough to carry the water down into the side ditch. A rise of one inch to a foot is sufficient. On steep grades, a greater slope will be necessary, else the water will run down the road instead of into the ditch.

There is a very simple tool, concerning which much has been said during recent years, which may be used in obtaining a good roof and the necessary grade. This is the King Road Drag. Mr. King, the inventor of the drag, lives in Missouri where mile after mile of good roads are made of earth.

If a surface made of earth is kept sufficiently smooth and given a little grade, water falling on the surface will immediately run off. This desired surface and grade may be secured by the use of the road drag. Once the proper grade is secured, the drag is drawn over the road at more or less frequent intervals depending upon the condition of weather and traffic. The aim is to maintain a surface that will drain off all water as fast as it falls.

One is likely to be discouraged in the first use of the drag because excellent results are not secured at once. Work should be begun early in the spring, and usually one round with the drag is sufficient, but sometimes, if ruts are very deep, several rounds are necessary to fill them. The earth should be worked toward the center of the road, but this process need not be repeated very often after the work is well started; from that time on, it is only necessary to scrape off the bumps and fill horse and wagon tracks. Through the summer, it is usually best to use the drag a few hours after a rain; the stirring when wet tends to bake the surface and the soil particles run together forming an effective covering.

The drag may be used from the start in forming the crown of the roadbed, but the blade grader is usually more effective in first work. A little practice will soon enable one to become quite skillful in the use of the drag. The driver must move about on it in order to fill holes, scrape off little knolls, or gradually work the dirt toward the center of the road. It is claimed that one dragging every two or three weeks in summer will keep the surface in good condition. Where the drag will cover the road in one round, it takes but little time to do the work. Those who live on dirt roads can well afford to try this piece of apparatus.

The following description of the use of the drag is quoted from Mr. King, the originator: "As a general rule, haul the drag at an angle of 45 degrees to the center of the road. The action of the drag is controlled by four things:

1. *The Length of the Chain*, which is regulated by slipping it backward or forward through the hole in the ditch end of the drag. The length of the chain regulates the hold taken upon the earth. To make the chain longer is equivalent to putting weight on the drag. If your drag is too heavy, shorten the chain.

2. *The Position of the Snatch Hook* which attaches the double-tree. To move much earth or to cut small weeds, hitch the hook close to the ditch end of the drag and stand as nearly on the front slab as possible. Drive very slowly when so hitched.

This one hitch seems to be the hardest to learn. The others suggest themselves.

3. *Position of the Driver on the Drag.* To move earth. In a soft spot, stand on rear slab; on a hard spot, stand on front slab and drive slowly. If the drag clogs with weeds, sod, or mud, step to a point as far as possible from the ditch end of the drag.. To drop earth in a low place, step quickly from ditch end to other extreme. To fill a low place or mud hole nicely is the severest test of skill.

4. *Presence or Absence of Sharpness or Dullness of the Steel.* The steel may project half an inch below the wood at the ditch end of the drag but should come up flush with the wood at the other end of the drag.

It is not enough to give the roadbed the proper crown to take the water from the middle of it. The water must be taken off and *kept off*. The side ditches at all times must be open and free from trash. They must have proper fall and must be directed at short distances from the grade of the road or the volume of water will at times become so large as to wash deep ditches. It is not necessary that the side ditches be deep and dangerous in order to serve their purpose, but when water stands along the side of the road, something is wrong.

Sometimes tile is needed on one or both sides of the road to secure the proper drainage, but in most places this is not necessary. Grass should not be allowed to grow between the road proper and the side ditches. This catches sand and trash and soon the water does not reach the side ditches.

On steep grades water breaks are usually constructed across the road to prevent the water from flowing down the middle. These are somewhat of a nuisance and if the road is well crowned will not be necessary. If they must be built, they should be V-shaped so that they will not cause such inconvenience when heavy loads are hauled over them.

The matter of grade in roads is one of considerable importance. The more highly a road is improved, the smaller should be the maximum grade; and as roads approach an ideal, all

grades are practically eliminated. It would be useless to so improve a road that a team could pull with ease a load of 6,000 pounds if in the course of the haul they must ascend a grade up which they could pull not more than 4,000 pounds.

The force which a horse is able to exert depends upon its weight and conformation, temperament, kind of footing, the way it is shod, the manner in which it is hitched, and upon the driver. In ordinary farm work, a horse is working at about full capacity if it exerts a pull equal to one-tenth its own weight. That is, a horse weighing 1500 pounds will develop a pull of 150 pounds and keep it up at a walking gait all day. By a pull of 150 pounds we mean a force similar to the weight registered on a spring balance and not the load which the horse will draw. A team pulling a thirteen-inch breaking plow in clover sod will exert a force of about 300 pounds. For a short distance a horse can exert a pull equal to one-half or even three-quarters its own weight. The force necessary to pull a ton over different roads and the effect of grade on the load which the horse can draw are shown in the table below. It is assumed that if a horse can pull 1000 pounds on a level, he can pull the following loads up the indicated grade:

900 lbs. up a grade of	1 foot in 100 feet, or a	1 per cent grade
800 lbs. up a grade of	2 feet in 100 feet, or a	2 per cent grade
400 lbs. up a grade of	5 feet in 100 feet, or a	5 per cent grade
250 lbs. up a grade of	10 feet in 100 feet, or a	10 per cent grade

Once a fair roadway is secured a little care and attention will suffice to keep it in good repair. Most damage is done to earth roads in the winter and spring. There are laws which regulate the traffic over country roads, but these are seldom enforced. Section 4904 of the Revised Statutes of Ohio states "that it shall be unlawful for any person or persons, firm or corporation, in any county having free or toll macadamized, gravelled or stone roads, to transport over such roads in any vehicle having a tire of less than three inches in width, a burden including weight of vehicle of more than thirty-four hundred pounds."

The various counties in the State have laws applying to their particular conditions, which the county commissioners have power to enforce.

There are too many narrow-tired wagons used on farms and country roads. The following tables compiled from exhaustive experiments on roads and farms prove the beneficial effects of broad tires, both in regard to the draft wagon and rutting of the surface. The narrow tires were one and one-half inches wide and the broad tires six inches wide. The load in each case was 2000 pounds, including weight of wagon.

1. Dirt Road—

(a) Surface dry, free from ruts and dust.

Narrow tires required 137.3 pounds to pull the load.

Broad tires required 104.8 pounds to pull the load.

Difference in favor of broad tires, 32.5 pounds or 31 per cent.

(b) Clay Roads—

Surface soft to depth of three or four inches.

Narrow tire cut rut five or six inches deep.

Broad tire cut rut three and one-half inches deep.

Narrow tire required 340.1 pounds to draw load.

Broad tire required 490.8 pounds to draw load.

Difference in favor of narrow tire, 150.7 pounds, or 44.3 per cent.

2. Meadows—

(a) Timothy sod, moist but firm.

Narrow tire cut rut three and one-half inches deep.

Broad tire cut rut one-quarter to one inch deep, doing no perceptible damage.

Narrow tire required 420.8 pounds to draw load.

Broad tire required 305 pounds to draw load.

Difference in favor of broad tire, 115.8 pounds. or 38 per cent.

(b) Grass and stubble three inches high, ground soft and spongy.

Narrow tire cut rut five to six inches deep.

Broad tire cut rut one and one-half to two inches deep, doing no damage.

Narrow tire required 569.1 pounds to draw the load.

Broad tire required 323.6 pounds to draw the load.

Difference in favor of broad tire, 245.5 pounds, or 84 per cent.

It will be seen that in only one test out of four did the narrow tire have the advantage in draft, and that was where the surface of the road was soft, but the sub-surface was fairly hard. The narrow tire cut through to this hard surface while the broad tire remained on top. In all of the tests on meadows and plowed land, the difference was always in favor of the broad tire because on them the load was much more easily drawn and did much less damage to the field. One trial, four horses pulled the ton load on narrow tires, with an average draft of 876 pounds. Two horses pulled the same load over the same road with an average draft of 379.9 pounds, showing that the same load was less difficult for two horses on broad tires than for four horses on narrow tires. When it is considered that most of the hauling done by farmers is on their farms and not on the roads, this saving in draft is quite an item in the course of a year. When the protection to the field and roadbed is considered, it seems strange that there are so many narrow-tired wagons in use.

FEEDING EXPERIMENTS WITH COWS AND CALVES.

By

John Michels, North Carolina Experiment Station.

In most sections outside of the cotton belt the cost of protein feeds is high in comparison with those of a carbonaceous nature. In the South with its abundance of cottonseed meal, protein is relatively cheap. Because of these facts, the work of the stations outside of the cotton belt has been directed mainly toward securing data as to how wide a ration can be successfully fed to dairy cows. Obviously, from what has been stated above, an important problem with the North Carolina farmer is to determine how narrow a ration can be successfully fed. The experiment reported in this bulletin, therefore, was undertaken with a view of determining the relative economy of a narrow ration and of a medium wide ration.¹

Plan of Experiment.

The experiment was divided into three periods of twenty-eight days each. In periods I and III a narrow ration was fed consisting of 5 parts cottonseed meal, 4 parts wheat bran, 3 parts corn meal and 50 pounds corn silage. This ration had a nutritive ratio of approximately 1 :4. During period II the ration was the same as in periods I and III, except 2.5 pounds cottonseed meal were replaced by 2.5 pounds of corn meal, giving this ration a nutritive ratio of approximately 1 :5.7. Each period was preceded by ten days preliminary feeding.

Eight cows from three to six weeks in lactation were used for the experiment. Cows Nos. 6 and 7 received 9 pounds of grain; Nos. 1 and 4, 10 pounds; No. 2, 11 pounds; and Nos. 3, 5 and 8, 12 pounds. The grain was always fed before the roughage.

The milk from each cow was weighed daily, and composite samples of it were tested weekly by the Babcock test. The cows

¹ In a wide ration there is less protein in proportion to carbonaceous matter than in a narrow ration.

themselves were weighed once a week throughout the experiment.

Results.

The result obtained from the individual cows during the different periods are presented in the following table:

TABLE I.—Showing Milk, Butterfat Test and Butterfat Yield and Live Weight.

NO. COW	PERIOD	MILK	Butter-fat —Per Cent	Butter-fat —lbs.	Av' age weight of cows —lbs.
1	I. Narrow ration.....	560.8	5.1	28.6	756
	II. Medium ration.....	522.0	4.5	23.4	762
	III. Narrow ration.....	491.0	4.8	23.5	771
2	I. Narrow ration.....	622.9	5.6	34.8	837
	II. Medium ration.....	645.8	5.5	35.5	837
	III. Narrow ration.....	561.4	5.7	39.1	835
3	I. Narrow ration.....	857.8	4.4	37.7	702
	II. Medium ration.....	753.9	4.3	32.4	691
	III. Narrow ration.....	752.6	4.5	33.8	674
4	I. Narrow ration.....	555.5	5.4	29.9	788
	II. Medium ration.....	467.1	4.6	21.3	781
	III. Narrow ration.....	433.1	5.4	23.3	782
5	I. Narrow ration.....	761.9	4.0	30.4	932
	II. Medium ration.....	696.2	4.0	27.8	900
	III. Narrow ration.....	675.7	4.1	27.7	897
6	I. Narrow ration.....	455.7	5.8	26.4	856
	II. Medium ration.....	407.0	5.9	24.0	852
	III. Narrow ration.....	354.0	5.9	20.8	865
7	I. Narrow ration.....	432.1	4.6	19.8	748
	II. Medium ration.....	405.1	4.5	18.2	744
	III. Narrow ration.....	380.8	4.9	18.6	748
8	I. Narrow ration.....	701.6	4.3	30.1	1004
	II. Medium ration.....	570.2	4.1	23.4	1013
	III. Narrow ration.....	630.7	4.1	25.8	1021

The results presented in Table I show that with one exception all cows produced more butterfat during the first period than during the second, while in the third period some cows produced a little more, and some a little less butterfat than was produced in the second period. The weight of the cows was practically the same throughout the experiment except of cows Nos. 3 and 8. Cow No. 3 gradually lost in weight, while cow No. 8 gained during the progress of the trial. Attention is also called to the test of the milk, which was practically lower with most cows during the middle period than either during the preceding or following period.

The results of the experiment are brought out more forcibly in the following table:

TABLE II.—Showing Total Yield of Milk and Butterfat and Total Live Weight.

PERIOD	Milk - Pounds	Butter-fat —Per Cent	Butter-fa —lbs.	Total Live Weight —Lbs.
I. Narrow ration.....	4978.3	4.90	237.7	6623
II. Medium ration.....	4668.3	4.67	206.0	6580
III. Narrow ration.....	4279.3	4.92	205.6	6593
Average of Periods I and III.....	4628.8	4.91	221.5	6610

Comparing the average results secured in periods I and III with those of period II it is found that the narrow ration produced 7.5 per cent more butterfat, increased the butterfat test 0.24 per cent and the total live weight 30 pounds. The milk yield was practically the same.

Second Trial.

The results of this trial are rather contrary to matters generally regarded as fairly mixed, namely, that the feed does not influence the richness of milk and that a fairly wide ration is

more efficient than a narrow one. In view of this it was thought desirable to duplicate the work to see if the results obtained could be substantiated or reasonably duplicated.

In the second trial the kind, amount, and proportion of feed as well as the general method of recording results, were the same as in the first trial. To add strength to the results, however, it was thought best to reverse the feeding periods. In the first trial the narrow ration was fed during the first and third periods and the medium ration during the second period. In the second trial the medium ration was fed during the first and third periods and the narrow during the second. The number of cows in the first trial was eight, while only five were used in the second trial. The results obtained from the individual cows during the different periods of the second trial are presented in the following table:

TABLE III.—Showing Milk, Butterfat Test, Butterfat Yield and Live Weight.

NO. COW	PERIOD	Milk—Pounds	Butter-fat—Per Cent	Butter-fat—Lbs.	Average Weight of Cows—lbs.
1	I. Medium ration.....	519.1	5.60	29.20	852
	II. Narrow ration.....	500.8	6.00	30.05	865
	III. Medium ration.....	468.8	6.15	27.83	876
2	I. Medium ration.....	632.1	5.55	35.08	903
	II. Narrow ration.....	591.3	6.06	35.83	890
	III. Medium ration.....	499.0	6.23	31.10	899
3	I. Medium ration.....	752.8	3.7	27.85	934
	II. Narrow ration.....	754.7	3.86	29.13	961
	III. Medium ration.....	617.1	4.15	25.61	993
4	I. Medium ration.....	733.6	4.75	34.85	769
	II. Narrow ration.....	648.0	5.62	36.42	765
	III. Medium ration.....	551.0	5.73	31.59	760
5	I. Medium ration.....	636.7	4.48	28.49	794
	II. Narrow ration.....	581.7	4.88	28.39	809
	III. Medium ration.....	536.1	4.77	25.45	820

The table shows that with one exception all cows produced more butterfat during period II when the narrow ration was fed, than in either the preceding or following periods during which the medium ration was fed. The exception is cow No. 5, which yielded slightly less butterfat in period II than in period I, but considerably more than in period III.

The rise in the per cent of butterfat is very marked in changing from the medium to the narrow ration, but far less so in changing from the narrow to the medium ration, indicating that the narrow ration tends to raise the per cent of butterfat in milk.

The yield of milk gradually dropped from the beginning to the close of the test except in the case of cow No. 3, which gave slightly more milk in Period II than Period I. Three cows gained in weight during the trial, while two lost slightly in weight, the loss or gain being uniform from the beginning to the close of the test.

The results of the experiment are brought out more forcibly in the following table:

TABLE IV.—Showing Total Yields of Milk, Butterfat, and Live Weight.

PERIOD	Milk— Pounds	Butter-fat — Per Cent	Butter-fat — Lbs.	Total Live Weight — lbs.
I. Medium ration.....	3274.3	4.82	155.47	4252
II. Narrow ration.....	3076.5	5.28	159.82	4290
III. Medium ration.....	2672.0	5.40	141.58	4351
Average of Periods I and III.....	2973.1	5.11	148.52	4301

Comparing the Average results secured in periods I and III with those of period II it will be found that the narrow ration produced 7.6 per cent more butterfat, increased the butterfat 0.17 per cent and the amount of milk 93.4 pounds, the live weight remaining practically the same.

Comparison of Results of the Two Trials.

In regard to the yield of butterfat the results of the two trials are almost identical. In the first trial there was an increase of 7.5 per cent in butterfat yield in favor of the narrow ration; during the second period the increase was 7.6 per cent. The narrow ration also showed a higher per cent of butterfat in both trials, being 0.24 per cent higher in the first trial and 0.17 per cent in the second. The yield of milk was 0.8 per cent greater with the medium ration during the first trial, but during the second trial the narrow ration produced the more milk, being 3.4 per cent greater than that from the medium ration. The live weight of the cows was practically the same for both narrow and medium ration during both trials.

Relative Economy of Narrow and Medium Ration.

So far as concerns the experimental results in this bulletin, a comparison of the "narrow" and "medium" rations is equivalent to a comparison of corn meal and cottonseed meal. It was learned that cottonseed meal (narrow ration) produced more butterfat than the corn meal (medium ration), when fed in the quantity and combination as reported in these trials. To get the full difference in the value of these two feeds, however, it is necessary to consider, in addition to their respective values as butterfat producers, also their market and fertilizing values.

It was stated at the outset that the ration fed during Period II was the same as that fed during Periods I and III, except that 2.5 pounds of cottonseed meal were replaced by an equal weight of corn meal. The cost of the former feed was 1.3 cents per pound, while that of the latter was 1.5 cents, making a saving of 0.2 cent per pound in favor of the cottonseed meal.

Comparing the two feeds solely on the basis of their fertilizing value it is found that cottonseed meal is worth 1.4 cents per pound and corn meal 0.38 cent per pound, a difference of 1.02 cents per pound in favor of the cottonseed meal. Adding to this the difference in the original cost of the two feeds, we find that each pound of cottonseed meal replaced by an equal weight of

corn meal, effected a saving of 1.22 cents when both the original cost and the fertilizing ingredients are considered. But to this must be added the increase in the butterfat production, which was found to be 7.5 per cent when 2.5 pounds of cottonseed meal were substituted for an equal weight of corn meal. Valuing butterfat at 30 cents per pound, the extra yield of butterfat increased the returns from cottonseed meal 0.9 cent for each pound fed in place of corn meal. Adding this to the 1.22 cents found above, we find that for each pound of corn meal replaced by an equal weight of cottonseed meal, a saving of 2.12 cents was effected for each pound so replaced. With a herd of ten cows fed one year under the conditions of the experiments detailed here, this would mean a total saving of \$193.55.

Health of Cows.

So far as this experiment is concerned there was nothing whatever to indicate that a narrow ration (1 :4) has any detrimental influence on the health of cows. In this connection it may be stated that no positive conclusions regarding this matter could be drawn from a short feeding experiment. The writer's data in reference to this point, however, are not limited to those obtained in the experiments detailed here; they cover four years' work with from fifteen to fifty cows, which were fed on an average not less than six months a year on rations containing a nutritive ratio of about 1 :4.¹ In all cases where such a narrow ration was fed, corn silage formed the main part of the roughage and we feel positive that no injury can be done a cow by feeding a narrow ration when corn silage forms the main part of the roughage, even when the narrow ration is obtained by feeding concentrates in which cottonseed meal forms the main part, provided, of course, that the meal is in first-class condition.

¹ S. C. Sta. Buls., 117 and 131.

Relative Feeding Value of Cottonseed Meal and Linseed Meal for Milk Production.

The experiment was divided into three periods of twenty-four days each, the first seven days of each period being counted as preliminary. In Periods I and III a ration was fed consisting of 10 parts wheat bran, 10 parts cottonseed meal, 5 parts corn meal, and 5 parts linseed meal. The grain ration during the second period differed from this in that 10 parts of linseed meal were fed only 5 parts of cottonseed meal. Of these grain mixtures, cows Nos. 1, 4 and 5 received 13 pounds daily, while Nos. 2 and 3 received 11 pounds daily. Each cow received uniformly 45 pounds of silage throughout the test. All of the cows were in the early stages of lactation.

The milk from each cow was weighed daily and composite samples of it were tested weekly by the Babcock test. The cows were regularly weighed once a week.

Results.

The results obtained from the individual cows during the different periods are presented in the following table:

TABLE V.—Showing Milk, Butterfat Test, Butterfat Yield and Live Weight.

No. of Cow	Period	Milk— Pounds	Butter-fat Per Cent	Butter-fat Pounds	Total Live Weight— Pounds
I.	Cottonseed meal	649.9	4.4	28.59	984
II.	Linseed meal	582.6	4.2	24.47	924
III.	Cottonseed meal	538.6	4.1	22.62	912
I.	Cottonseed meal	370.5	4.1	15.19	992
II.	Linseed meal	342.3	4.1	14.03	995
III.	Cottonseed meal	326.04	4.2	13.70	970
I.	Cottonseed meal	396.8	5.0	19.84	748
II.	Linseed meal	368.2	4.9	18.04	712
III.	Cottonseed meal	315.2	4.8	15.13	715
I.	Cottonseed meal	470.2	4.4	20.68	865
II.	Linseed meal	470.4	4.5	21.16	849
III.	Cottonseed meal	476.9	4.5	21.46	855
I.	Cottonseed meal	577.6	4.1	23.68	766
II.	Linseed meal	530.6	4.2	22.28	735
III.	Cottonseed meal	540.2	4.3	23.22	739

The table shows the yield of milk and butterfat gradually decreased throughout the test except with cows Nos. 4 and 5, which show a slight decrease during Period III. The per cent of butter fat was practically the same throughout the test. There was also a decrease in live weight as the test progressed, except in case of cows Nos. 3, 4 and 5, which showed a slight increase during Period III.

The results of the experiment are brought out more forcibly in the following table:

TABLE VI.—Total Yield of Milk and Butterfat and Total Live Weight.

Period	Milk— Pounds	Butter-fat —Per Cent	Butter-fat —Pounds	Total Live Weight— Pounds
I. Cottonseed meal	2,465.0	4.40	108.46	4,355
II. Linseed meal	2,294.1	4.38	100.48	4,215
III. Cottonseed meal	2,197.3	4.40	96.68	4,191
Average I and III	2,331.1	4.40	102.72	4,273

The table shows that the cottonseed meal gave slightly greater returns than the linseed meal. The difference, however, is so slight that it would seem unwise not to feed a small quantity of the linseed meal in place of cottonseed meal where there is the slightest need of the tonic effect which linseed meal is capable of producing. The cost of a ton of linseed meal averages about 15 to 20 per cent higher than cottonseed meal.

Linseed Meal As a Tonic Food.

The great tonic value of linseed meal is evidenced by the fact that most of the so-called patent foods and condition powders are largely made up of linseed meal. It is a laxative feed and for this reason large quantities of it should never be fed as a daily ration. It is especially suited to young stock, being rich in growing material, such as protein and ash. Indeed there is no class of farm animals to which some linseed meal cannot be fed to advantage, especially when the animals are deprived for

long periods of green or succulent feeds. Linseed meal takes the place of the high price patent tonic stock feeds and costs on an average only about one-tenth as much. Every well regulated stock farm should always be provided with linseed meal.

Miscellaneous Feeding Trials.

Observations have been made as to the effect of feeding cows a ration containing one-third cottonseed meal during the month preceding calving. No ill effects of such feeding were noticeable. It should be borne in mind, however, that the cows received a liberal amount of corn silage during the time these observations were made. Our feeding trials have well established the fact that cottonseed meal can be fed with much greater safety in conjunction with silage than with dry roughage.

In another investigation involving over twenty animals observations were made on the effects of feeding a grain ration, consisting of one-third cottonseed meal, to heifers ranging from six to eighteen months of age. The daily grain allowance ranged from one and one-half pounds for the six months' old heifers to two and three-quarter pounds for the eighteen months' old heifers. The amount of meal fed in these trials did not appear to interfere in the least with the vigor and development of the animals. One-half of the roughage fed consisted of corn silage.

Investigations have also been made on the effects of feeding calves on old pasteurized milk and on skim-milk soured with pure cultures of lactic acid bacteria. In the main, the old pasteurized skim-milk did not appear to have any appreciable effect on calves, though the same had a tendency to produce scours when badly curdled. Feeding skim-milk sourced with lactic acid bacteria did not induce scours; on the contrary, such milk had an appreciable constipating effect. This constipating effect was so marked as to prove quite efficacious in checking calf scours. More data is needed to positively prove to what extent skim-milk soured with pure cultures of lactic can be used as a cure for calf scours.

Illinois Dairy and Food Law.*

AN ACT *to prevent fraud in the sale of dairy products, their imitation or substitutes, to prohibit and prevent the manufacture and sale of unhealthful, adulterated or misbranded food, liquors or dairy products, to provide for the appointment of a State Food Commissioner and his assistants, to define their powers and duties and to repeal all Acts relating to the production, manufacture and sale of dairy and food products and liquors in conflict herewith.*

Section 1. *Be it enacted by the People of the State of Illinois represented in the General Assembly:*

Provision for Appointment of a State Food Commissioner and the Establishment of a State Food Department.—That the Governor shall appoint a commissioner who shall be known as the State Food Commissioner, who shall be a citizen of the State of Illinois, and who shall hold his office for a term of four years and until his successor is appointed and qualified, and who shall receive a salary of thirty-six hundred dollars per annum, and his necessary expenses incurred by him in the discharge of his official duties, and who shall be charged with the enforcement of all laws that now exist or that hereafter may be enacted in this State regarding the production, manufacture, sale and labeling of food as herein defined, and to prosecute or cause to be prosecuted any person, firm or corporation, or agent thereof, engaged in the manufacture or sale of any article manufactured or sold in violation of the provisions of any such law or laws. The Governor shall also appoint from time to time, as required, a Food Standard Commission, for the purpose of determining and adopting standards of quality, purity or strength, for food products, for the State of Illinois, to consist of three members,

(*Enacted 1907 and amended 1909 and 1911.)

one of whom shall be the State Food Commissioner or his representative, who shall serve without extra pay; one of whom shall be a representative of the Illinois food manufacturing industries, and one of whom shall be an expert food chemist of known reputation; all to be citizens of the State of Illinois, who shall receive fifteen dollars (\$15.00) per day for a period not exceeding thirty (30) days in one year, and necessary expenses incurred during the time employed in the discharge of their duties: *Provided*, that said Food Standard Commission, in determining and adopting a standard of quality, purity, or strength, of milk or cream, shall fix such standard as may be determined solely by the examination and test of milk or cream and the can or receptacle in which it is placed.

The said commissioner is hereby authorized to appoint, with the advice and consent of the Governor, one assistant commissioner, who shall be a practical dairymen, whose salary shall be three thousand dollars (\$3,000.00), per annum and expenses incurred in official duties. One chief chemist who shall be known as State Analyst, whose salary shall be twenty-five hundred dollars (\$2,500.00) per annum and expenses incurred in the discharge of official duties. One attorney whose salary shall be eighteen hundred dollars (\$1,800.00) per annum and expenses incurred in the discharge of official duties. One chief clerk, whose salary shall be eighteen hundred dollars (\$1,800.00) per annum and expenses incurred in the discharge of official duties. One assistant clerk, whose salary shall be twelve hundred dollars (\$1,200.00) per annum and expenses incurred in the discharge of official duties. Three stenographers at one thousand dollars (\$1,000.00) per annum. Twelve inspectors whose salaries shall be as follows: For the first two years of service twelve hundred dollars each, annually; for the third year of service, fourteen hundred dollars each, annually; and for each succeeding year of service an additional increase of one hundred dollars per year each, until the maximum of eighteen hundred dollars a year each is attained, and expenses incurred in the discharge of their official duties. Said commissioners shall also have authori-

ty to appoint one bacteriologist at eighteen hundred dollars (\$1,800.00) per annum and expenses incurred in the discharge of his official duties; and seven analytical chemists, whose salaries shall be as follows: For the first two years of service, twelve hundred dollars each, annually; for the third year of service, fourteen hundred dollars each, annually; for the fourth year of service, fifteen hundred dollars each, annually, and for each succeeding year of service an additional increase of one hundred dollars per year each, until the maximum of eighteen hundred dollars per year is attained, and expenses incurred in the discharge of their official duties, and one laboratory janitor at seven hundred and twenty dollars (\$720.00) per annum.

The said commissioner shall make annual reports to the Governor not later than the 15th of January, of his work and proceedings, and shall report in detail the number of inspectors he has appointed and employed, with their expenses and disbursements and the amount of salary paid the same, and he may, from time to time, issue bulletins of information, when in his judgment the interests of the State would be promoted thereby.

The said commissioner shall maintain an office and laboratory, where the business of said department may be conducted. This section shall not effect (affect) the term of office of the present commissioner, and he shall be regarded as having been appointed under the provisions of this Act.

The Food Commissioner shall make analyses and examinations for the state Charitable Institutions, of foods, drugs, and such other supplies as the laboratory of the State Food Commission is equipped and prepared to examine and analyze.

Section 2. *Power of Commissioner and Inspectors Making Inspection*—The State Food Commissioner, and such inspectors and agents as shall be duly authorized for the purpose, when and as often as they may deem it necessary for the purpose of determining whether any manufactured food complies with the law, shall examine the raw materials used in the manufacture of food products and determine whether any filthy, decomposed or putrid substance is used in their preparation. They may also

examine all premises, carriages or cars where food is manufactured, transported, stored or served to patrons, for the purpose only of ascertaining their sanitary condition and examining and taking samples of the raw materials and finished products found therein; but nothing in this Act shall be construed as permitting close trade rights or secret processes, or methods of manufacture, or requiring or compelling proprietors or manufacturers, or packers of proprietary or other food products, to disclose trade rights or secret processes, or methods of manufacture. Said commissioner, inspectors and agents shall also have power and authority to open any package, can or vessel containing or supposed to contain any article manufactured, sold or exposed for sale, or held in possession with intent to sell, in violation of the provisions of this Act, or laws that now exist, or that may hereafter be enacted in this State, and may inspect the contents thereof, and may take samples therefrom for analysis. The employes of railroads, express companies or other common carriers shall render to them all the assistance in their power, when so requested, in tracing, finding or disclosing the presence of any article prohibited by law, and in securing samples thereof as hereinafter provided for.

Section 3. *Refusal to Assist Inspector a Misdemeanor*—Whoever, by himself, his agent, employe, or servant, hinders, obstructs, or in any way interferes with any inspector, analyst, or officer appointed hereunder, in the performance of his duty, or in the exercise of his powers as defined in this Act, or whoever being an employe of a railroad, express company, or other common carrier refuses or fails upon request to assist the State Food Commissioner, the Assistant Commissioner, the State Analyst, or any Inspector appointed hereunder in tracing, finding or disclosing the presence of any article of food prohibited by law and in securing samples thereof as provided for in section 2 of this Act, shall be deemed guilty of a misdemeanor and shall be punished as hereinafter provided for.

Section 4. The person taking such a sample as provided

for in section 2 of this Act, shall in the case of bulk or broken package goods, divide the same into two equal parts, as nearly as may be, and in the case of sealed or unbroken packages, he shall select two of said packages, which two said packages shall constitute the sample taken, and properly to identify the same, he shall, in the presence of the person from whom the same is taken, mark or seal each half or part of such sample with a paper seal or otherwise, and shall write his name thereon and number each part of said sample with the same number, and also write thereon the name of the said dealer in whose place of business the sample is found, and the person from whom said sample is taken shall also write his own name thereon, and at the same time the person taking said sample shall give notice to such person from whom said sample is taken that said sample was obtained for the purpose of examination by the State Food Commissioner. One part of said sample shall be taken by the person so procuring the same to the State Analyst or other competent person appointed for the purpose of making examinations or analysis of samples so taken, and the person taking such sample shall tender to the person from whom it is taken the value of that part thereof so retained by the person taking said sample; the other part of said sample shall be delivered to the person from whom said sample is taken. If the person from whom said sample is taken has recourse upon the manufacturer or guarantor, either by operation of law or under contract for any failure on the part of said sample to comply with the provisions of this Act, then said person from whom said sample is taken shall retain for the period of six months that part of said sample so delivered to him in order that said manufacturer or guarantor may have the same examined or analyzed if he so desires.

Provided, that the person procuring said sample may securely pack and box that part thereof retained by him and send the same to the State Analyst or other competent person appointed hereunder, and the testimony of the person procuring

said sample that he did procure the sample and that he sealed and numbered the same as herein provided, and that he wrote his name thereon, and that he packed and boxed said part thereof and sent the same to the State Analyst or other competent person appointed hereunder, and the testimony of the person analyzing said sample that he received the same in apparent good order, that said sample was sealed, and that the number thereof and the name of the sender, as herein provided for, was on said sample, and that the seal at the time the same was received was unbroken, shall be *prima facie* evidence that the sample so received is the sample that was sent, and that the contents thereof are the same and in the same condition as at the time the person so procuring said sample parted with the possession thereof, and the testimony of said two witnesses as above shall be sufficient to make *prima facie* proof.

Section 5. *Manufacturing Adulterated or Misbranded Food Misdemeanor*.—It shall be unlawful for any person to manufacture for sale within the State of Illinois any article of food or drink which is adulterated or misbranded within the meaning of this Act, and any person who shall violate any of the provisions of this section shall be guilty of a misdemeanor and, on conviction thereof, shall be punished according to the provisions of this Act:

Provided, that no other article of food shall be deemed misbranded or adulterated within the provisions of this Act when intended for export to any foreign country or purchaser, and prepared or packed according to the specifications or directions of the foreign country to which said article is intended to be shipped; but said article shall be in fact sold or offered for sale for domestic use or consumption, then this proviso shall not except said article from the operation of any of the other provisions of this Act.

Section 6. *Possession Misbranded or Adulterated Articles Prohibited*.—The having in possession of any article of food or drink which is misbranded or adulterated, with intent to sell

the same, is hereby prohibited; and whoever shall have in his possession, with the intent to sell, or offer for sale, any article which is adulterated or misbranded within the meaning of this Act, shall be guilty of a misdemeanor, and, on conviction thereof, shall be punished as hereinafter provided. Proof that any person, firm or corporation has or had possession of any article which is adulterated or misbranded shall be *prima facie* evidence that the possession thereof is in violation of this section.

Section 7. *Term Food Defined.*—The term “food,” as used herein, shall include all articles used for food, drink, confectionery or condiment by man or other animals, whether simple, mixed or compounded, and any substitute used as a constituent in the manufacture thereof.

Section 8. *Defines Adulteration.*—That for the purpose of this Act, an article shall be deemed to be adulterated—

In case of confectionery:

First—If it contains terra alba, barytes, talc, chrome yellow, paraffin, mineral fillers or poisonous substances, or poisonous color or flavor.

Second—If it contains any ingredient deleterious or detrimental to health, or any vinous, malt or spirituous liquor or compound, or narcotic drug.

In case of food:

First—If any substance has been mixed or packed with it so as to reduce or lower or injuriously affect its quality, strength or purity.

Second—If any substance has been substituted wholly or in part for the article.

Third—If any valuable constituent of the article has been wholly or in part abstracted: *Provided*, that in the manufacture of skim or separated cheese the whole or part of the butter fats in the milk may be abstracted.

Fourth—If it be mixed, colored, powdered, coated, polished or stained in any manner whereby damage or inferiority is concealed, or it is made to appear better or of greater value than it really is.

Fifth—If it contains any added poisonous or other deleterious ingredient which may render such article injurious to health: *Provided*, that when in the preparation of food products for shipment they are preserved by an external application, applied in such a manner that the preservative is necessarily removed mechanically, or by maceration in water, or otherwise, and directions for the removal of said preservatives shall be printed on the covering of the package, the provisions of this Act shall be construed as applying only when such products are ready for consumption; and formaldehyde, hydrofluoric acid, boric acid, salicylic acid and all compounds and derivatives thereof are hereby declared unwholesome and injurious.

Sixth—If it consists in whole or in part of a filthy, decomposed or putrid, infected, tainted or rotten animal or vegetable substance or article, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter.

Section 9. *Misbranded Defined*.—The term “misbranded” as used herein, shall apply to all articles of food or drink, or articles which enter into the composition of food or drink, the packages or label (s) of which shall bear any statement, design, or device regarding such article, or the ingredients or substance contained therein which shall be false or misleading in any particular; and to any such products which are falsely branded as to manufacturer, packer, or dealer who sells the same or as to the state, territory, or country in which it is manufactured or produced. That for the purpose of this Act an article shall be deemed to be misbranded—

In case of food:

First—If it be an imitation of or offered for sale under the distinctive name of another article.

Second—If it be labeled or branded so as to deceive or mislead the purchaser, or purports to be a foreign product when not so, or if the contents of a package as originally put up shall have been removed in whole or in part and other contents shall have been placed in such package, or if it shall fail to bear a

statement on the label of the quality or proportion of any morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, canabis indica, chloral hydrate, or acetanilid, or and derivative or preparation of any such substances contained therein.

Third—If in any package form and the contents are stated in terms of weight or measure, they are not correctly and plainly stated on the outside of the package.

Fourth—If it be a manufactured article of food or food solid in package form, and is not distinctly labeled, marked or branded with the true name of the article, and with either the name of the manufacturer and place of manufacture, or the name and address of the packer or dealer who sells the same.

Fifth—If the package containing it or its label shall bear any statement, design or device regarding the ingredients of the substance contained therein, which statement, design or device shall be false or misleading in any particular: *Provided*, that an article of food which does not contain any added poisonous or deleterious ingredients shall not be deemed to be adulterated or misbranded in following cases:

First—In case of mixtures or compounds which may be now or from time to time hereafter known as articles of food under their own distinctive names, and not an imitation of or offered for sale under the distinctive name of another article, if the name be accompanied on the same label or brand with a statement of the place where the article has been manufactured or produced.

Second—In case of articles labeled, branded or tagged so as to plainly indicate that they are compounds, imitations or blends, and the word "compound," "imitation" or "blend," as the case may be, is plainly stated on the package in which it is offered for sale: *Provided*, that the term "blend," as used herein, shall be construed to mean a mixture of like substances, not excluding harmless coloring or flavoring ingredients used for the purpose of coloring and flavoring only; and as applied to alcoholic beverages, only those distilled spirits shall be regarded as "like sub-

stances" which are distilled from the fermented mash of grain and are of the same alcoholic strength: *And, provided, further,* that nothing in this Act shall be construed as requiring or compelling proprietors or manufacturers of proprietary foods, which contain no unwholesome added ingredients to disclose their trade formulas, except in so far as the provisions of this Act may require to secure freedom from adulteration or misbranding.

Third—In the case of mixtures of corn syrup (glucose) or corn sugar (dextrose) or corn sugar syrup, with cane or beet sugar (sucrose) or cane or beet sugar syrup, in food, if the maximum percentage of corn syrup (glucose), or corn sugar (dextrose) or corn sugar syrup, in such article of food be plainly stated on the label.

Section 10. *Condemnation and Confiscation of Misbranded or Adulterated Foods*—Any article of food or drink or liquor that is adulterated or misbranded within the meaning of this Act, or that is made, labeled or branded contrary to the provision of this Act, or that does not conform to the definition or analytical requirements provided in this Act, and is being sold or offered for sale or exposed for sale within the State of Illinois, shall be liable to be proceeded against in any court of record or before any judge thereof, or before any justice of the peace within whose jurisdiction the same may be found, and seized for condemnation and confiscation; and authority and jurisdiction are hereby vested in the several courts of record, the judges thereof in vacation, and the several justices of the peace, to issue the warrant and to hear and determine the proceedings herein provided for. Such proceedings shall be by complaint, verified by affidavit, and in the name of the People of the State of Illinois against the article or articles proceeded against, particularly describing the same, the place where they are located, the name of the person, firm or corporation in whose possession they are found, and wherein they violate the provisions of this Act. Thereupon said court, judge or justice of the peace shall issue a warrant directed to the sheriff, bailiff or any constable of the

county, commanding such officer to seize and take into his possession the article or articles described in the complaint, and bring the same before the court, judge or justice of the peace who issued the warrant, and to summon the person, firm or corporation named in the warrant, and any other person who may be found in possession of the said articles to appear at the time and place therein specified, which service shall be made in the same manner as service of process in civil cases in such court or before such justice of the peace. The hearing upon such complaint shall be at the time and place specified in the warrant, which time shall be not less than five (5) days nor more than fifteen (15) days from the date of issuing the warrant: *Provided*, that if the execution and service of the warrant as aforesaid is had less than three (3) days before the return day of the warrant, then the claimant shall be entitled to a reasonable continuance. Upon the hearing the complaint made may be amended, and any person, firm or corporation that appears and claims the said article or articles shall be required to file its claim in writing. Except as herein provided, the proceedings shall conform as near as may be to the proceedings upon search warrants, except that either party may demand a trial by jury upon any issue of fact joined in any such case. And if such article is condemned as being adulterated or misbranded, or of a poisonous or deleterious character within the meaning of this Act, or as made, labeled or branded contrary to the provisions of this Act, or as not conforming to the definition or analytical requirements provided in this Act, the same shall be confiscated and disposed of by destruction or sale, as the court, judge or justice of the peace may direct, and the proceeds thereof, if sold, less than legal costs and charges, shall be paid into the treasury of the State of Illinois, but such article shall in no instance be sold contrary to the provisions of this Act: *Provided, however*, that upon the payment of the costs of such proceedings and the execution and delivery of a good and sufficient bond to the State Food Commission for the use of the People of the State of Illinois, to the effect that

such articles shall not be sold or otherwise disposed of contrary to the provisions of this Act, the court may, by order, direct that such articles be delivered to the owner thereof.

Section 11. *Vinegar To Be Branded*.—All vinegar made by fermentation and oxidation without the intervention of distillation, shall be branded with the name of the fruit or substance from which the same is made. All vinegar made wholly or in part from distilled liquor shall be branded “distilled vinegar,” and shall not be colored in imitation of cider vinegar. All vinegar shall be made wholly from the fruit or grain from which it purports to be or is represented to be made, shall contain no foreign substance, and shall contain not less than four per cent, by weight, of absolute acetic acid. Any vinegar made or manufactured contrary to the provisions of this section shall be deemed to be adulterated within the meaning of this Act. Any vinegar which is not branded as herein provided shall be deemed to be misbranded within the meaning of this Act.

Section 12. *Extracts To Be Labeled*.—Extracts made of more than one principle shall be labeled in a conspicuous manner with the name of each principle, or else with the name of the inferior or adulterant; and in all cases when an extract is labeled with two or more names, such names must be in a conspicuous place on said label, and in no instance shall such mixture be called imitation, artificial or compound, and the name of one of the articles used shall not be given greater prominence than another: *Provided*, that all extracts which cannot be made from the fruit, berry, bean or other part of the plant, and must necessarily be made artificially, as raspberry, strawberry, etc., shall be labeled “imitation” in letters similar in size and immediately preceding the name of the article: *Provided, however*, that prepared cocoanut, containing nothing other than cocoanut, sugar and glycerine, shall be labeled as prepared cocoanut, and when so made need not be labeled “compound” or “mixture.” Any such extract not labeled as herein provided for shall (be) deemed to be misbranded within the meaning of this Act.

Section 13. *Baking Powder—How Labeled.*—No person by himself, his servant or his agent, or as the servant of any other person, shall, first, make or manufacture baking powder or any other mixture or compound intended for use as baking powder; second, or sell, exchange, deliver or offer for sale or exchange such baking powder or any mixture or compound intended for use as baking powder, unless the same shall contain not less than ten per cent available carbon dioxide and unless the common names of all the ingredients be printed on the label.

Section 14. *Adulterated, Spirituous, Malt or Vinous Liquors Prohibited.*—No person shall within this State, by himself, his servant or agent, or as a servant or agent of any other person or corporation, brew, distill, have or offer for sale, or sell any spirituous or fermented or malt liquor, containing any drug, substance or ingredient not healthful or not normally existing in said spirituous, fermented or malted liquor, or which may be deleterious or detrimental to health when such liquors are used as a beverage, and the following drugs, substances or ingredients shall be deemed to be not healthful and shall be deemed to be deleterious or detrimental to health when contained in such liquors, to-wit: Cocculus indicus, copperas, opium, cayenne pepper, picric acid, Indian hemp, strychnine, arsenic, tobacco, dandel seed, extract of logwood, salts of zinc, copper or lead, alum, methyl alcohol and its derivatives and any extracts or compounds of any of the above drugs, substances or ingredients and any person violating any of the provisions of this section shall be deemed guilty of a misdemeanor.

Section 15. *Mutilating Label Prohibited.*—Whoever shall deface, change, erase or remove any mark, label or brand provided for by this Act with intent to mislead, deceive or to violate any of the provisions of this Act, shall be held liable to the penalties of this Act.

Section 16. *Sale of Unclean or Unwholesome Milk for Consumption and Unsanitary Containers Prohibited.*—No person, firm or corporation shall offer for sale, or sell to any person,

firm or corporation, creamery or cheese factory, any unclean, unhealthful, unwholesome or adulterated milk or cream, or any milk or cream which has not been well cooled or to which water or any foreign substance has been added, or milk or cream which has been handled or transported in unclean or unsanitary vessels or containers: *Provided*, that nothing in this section shall be construed to prevent the sale of skim milk to factories engaged in the manufacture of skim milk products, nor the sale of skim milk under the provisions of section 19 of this Act.

Section 17. *Persons Receiving Milk To Wash Cans.*—Any person, firm or corporation who receives from any other person, firm or corporation, any milk or cream in cans, bottles or vessels which have been transported over any railroad or boat line, where such can, bottles or vessels are to be returned, shall cause the said cans, bottles or vessels to be emptied before the said milk or cream contained therein shall become sour, and shall cause said cans, bottles or vessels to be immediately washed and thoroughly cleansed and aired.

Section 18. *Not To Manufacture Food from Impure or Unclean Milk or Cream.*—No person, firm or corporation shall manufacture from unclean, impure, unhealthful or unwholesome milk, or from cream from the same, any article of food.

Section 19. *Sale of Skim Milk—Cans—How Labeled.*—No person, firm or corporation shall sell, or expose for sale, or have in his possession with intent to sell, in any store or place of business, or on any wagon or other vehicle, used in transporting milk from which cream has been removed, any such milk or milk commodity called "skim milk" without first attaching to the can, vessel or other package containing said milk, a tag with the words "skim milk" printed on both sides of said tag in large letters, each letter being at least three-fourths of an inch high and one-half inch wide. Said tag shall be attached to the top or side of said can, vessel or package where it can be easily seen.

Section 20. *Instruments for Measuring Milk and Cream Standards.*—The State standard milk measure or pipettes shall have for milk a capacity of seventeen and six-tenths cubic centimeters, and the State standard test tube or bottles for milk shall have a capacity of two cubic centimeters at a temperature of sixty degrees Fahrenheit between “zero” and ten on the graduated scale marked on the necks thereof. For cream nine or eighteen grams shall be used, and the standard test tubes or bottles for cream shall have a capacity of three or six cubic centimeters, respectively, at a temperature of sixty degrees Fahrenheit between “zero” and thirty on the graduated scale marked on the necks thereof, and it is hereby made a misdemeanor to use any other measure, pipette, test tubes or bottle to determine the per cent of butter fat where milk or cream is purchased by, or furnished to creameries or cheese factories, and where the value of said milk is determined by the per cent of butter fat contained in the same. Any manufacturer, merchant, dealer, or agent in this State who shall offer for sale or sell a cream or milk pipette or measure, test tube or bottle which is not correctly marked or graduated as herein provided, shall be guilty of a misdemeanor and upon conviction thereof shall be punished as provided in this Act.

Section 20a. No person shall operate a milk or cream testing apparatus to determine the percentage of butter fat in milk or cream for the purpose of purchasing the same either for himself or for another without first securing a license from the dairy and food commissioners of this State, authorizing such person to so operate such tester. Any person desiring to secure such license shall make application therefor on a blank to be prepared and provided by the dairy and food commissioner, and such applicant, before being issued such license, shall pass a satisfactory examination in person and prove by actual demonstration that he is competent and qualified to properly use such tester and make an accurate test with the same.

Such license shall be issued for a period of two (2) years

from and after the date of its issuance and a fee of one dollar (\$1.00) shall be paid for such license by the licensee upon the issuance thereof. The dairy and food commissioner for just cause shall have authority to revoke any license issued under the provisions of this Act.

The fees collected under the provisions of this section shall be paid into the State treasury monthly by the dairy and food commissioner.

Section 21. *Underreading Babcock Test Prohibited.*—It shall be unlawful for the owner, manager, agent, or any employe of a creamery or cheese factory to manipulate or under-read the Babcock test, or any other contrivance used for determining the quality or value of milk or cream or to falsify the record thereof, or to pay for such milk or cream on the basis of any measurement except the true measurement as thereby determined.

Section 22. *Sale of Preservatives Prohibited.*—No person, firm or corporation shall manufacture for sale, advertise, offer or expose for sale, or sell, any mixture or compound intended for use as a preservative or other adulterant of milk, cream, butter or cheese, nor shall he manufacture for sale, advertise, offer or expose for sale, or sell any unwholesome or injurious preservative or any mixture or compound thereof intended as a preservative of any food: *Provided, however,* that this section shall not apply to pure salt added to butter and cheese.

Section 23. *Vehicles To Be Marked.* Any person, firm or corporation, who shall in any of the cities, incorporated towns or villages of this State which contains a population of 5,000 or over, engage in or carry on a retail business in the sale or exchange of, or any retail traffic in milk or cream, shall have each and every carriage or vehicle from which the same is vend-ed, conspicuously marked with the name of such vender on both sides of such carriage or vehicle.

Section 24. *Illegal Lard.*—No person shall, within this State, manufacture for sale, have in his possession with intent

to sell, offer or expose for sale, or sell, as lard, any substance not the legitimate and exclusive product of the fat of the hog.

Section 25. *Lard Substitute*.—No person shall manufacture for sale within this State, or have in his possession with intent to sell, offer or expose for sale, or sell, as lard, or as a substitute for lard, or as an imitation of lard, any mixture or compound which is designed to take the place of lard and which is made from animal or vegetable oils or fats other than the fat of the hog, or any mixture or combination with any animal or vegetable oils or fats, unless the tierce, barrel, tub, pail or package containing the same shall be distinctly and legibly branded or labeled with the name of the person, firm or corporation making the same, together with the location of the manufactory and the words "lard substitute" or "adulterated lard" or "compound," "imitation" or "blend," as the case may be, or unless the same shall be sold under its own distinctive name, as provided for in section 9 of this Act.

Section 26. *Persons Selling Imitation or Substitute for Lard to Inform Purchaser*.—It shall be unlawful to sell or offer for sale any "lard substitute" or "adulterated lard" or "compound," "imitation" or "blend," as herein defined, without informing the purchaser thereof, or the person or persons to whom the same is offered for sale, that the substitute sold or offered for sale is "lard substitute" or "adulterated lard" or "compound," "imitation" or "blend," as the case may be.

Section 27. *Sale of Process Butter Not Branded Prohibited*.—No person, firm or corporation, agent or employe, shall manufacture for sale, sell or offer or expose for sale, in this State, any butter that is produced by taking original packing stock butter, or other butter, or both, and melting same so that the butter fat can be drawn off or extracted, then mixing the said butter fat with skimmed milk, or milk, or cream, or other milk product, and rechurning or reworking the said mixture, or that produced by any process that is commonly known as boiled, process or renovated butter, unless the same is branded or marked, as provided in section 28 of this Act.

Section 28. *Process Butter—How Branded.*—No person, firm or corporation, agent or employe, shall sell, offer or expose for sale, or deliver to a purchaser, any boiled, process or renovated butter, as defined in section 27 of this Act, unless the words "Renovated Butter" shall be plainly branded with gothic or bold face letters at least three-fourths of an inch in length on the top and sides of each tub, or box, or pail, or other kind of case or package, or on the wrapper of prints or rolls or bulk packages in which it is put up. If such butter is exposed for sale uncovered, or not in a case or package, a placard containing the label so printed shall be attached to the mass of butter in such a manner as to be easily seen and read by the purchaser. The branding or marking of all packages shall be in the English language, and in a conspicuous place so as to be easily seen and read by the purchaser.

Section 29. *Illegal Foods to be Seized.*—Whenever the commissioner or his agents shall have ground for suspicion that any article of food, found in possession of any person, firm or corporation, is adulterated or misbranded within the meaning of this Act, he may seize such article of food and make an inventory thereof, and shall leave a copy of such inventory with the party holding such suspected goods, and tag the same "suspected;" and he shall notify in writing the person, firm or corporation in whose possession it may be found, not to offer the same for sale or sell or otherwise dispose of the same until further notice in writing from the commissioner. Whereupon the commissioner shall forthwith cause a sample of said article of food to be examined or analyzed, and if the same shall be found to be adulterated or misbranded within the meaning of this Act, the commissioner shall proceed with a hearing and subsequent proceedings as provided in this Act. If, however, such examination or analysis shall show that such article of food complies with the provisions of this Act, the person, firm or corporation in whose possession such article of food is found shall forthwith be notified in writing that said seizure is released, and authority given

to dispose of such article of food. Such seizure may be had without a warrant and said commissioner, and all inspectors and agents appointed pursuant to law, are hereby given full power and authority of "policemen." Any court having jurisdiction, upon receiving proof of probable cause for believing in the concealment of any food or dairy product or substitutes therefor, or imitation thereof, kept for sale or for a purpose, or had in possession or under control, contrary to the provisions of this Act, or other laws which now exist or may be hereafter enacted, shall issue a search warrant and cause a search to be made in any place therefor, and to that end may cause any building, enclosure, wagon or car to be entered, and any apartment, chest, box, locker, tub, jar, crate, basket or package to be broken open and the contents thereof examined.

Section 30. *Search Warrants to be Issued for Illegal Food.*—All warrants issued pursuant to section 29 hereof shall be directed to the sheriff, bailiff or some constable of the county where such food or dairy products may be supposed to be concealed, commanding such officer to search the house or place where such food or dairy product, or substitute thereof, or imitation thereof for which he is required to search, is believed to be concealed, which place and the property to be searched for, shall be designated in the warrant, and to bring such food or dairy product or substitute therefor or imitation thereof, when found, and the person in whose possession the same is found, before the magistrate who issued the warrant, or before some other court or magistrate having jurisdiction of the case to be proceeded against as hereinbefore provided for in section 10 of this Act.

Section 31. *State's Attorney to Assist.*—It shall be the duty of the State's Attorney in any county of this State when called upon by the commissioner, or any of his assistants, to render any legal assistance in his power to execute the law and to prosecute cases arising under the provisions of this Act: *Provided*, that no person shall be prosecuted under the provisions of

this Act for selling or offering for sale any article of food or drugs as defined herein, when the same is found to be adulterated or misbranded within 'the meaning of this Act, in the original unbroken package in which it was received by said person when he can establish a guaranty signed by the wholesaler, jobber, manufacturer or other party residing in this State, to the effect that the same is not adulterated or misbranded in the original unbroken package in which said article was received by said dealer; within the meaning of this Act, designating it. Said guaranty to afford protection, shall contain the name and address of the party or parties making the sale of such article to such dealer, and in such case said party or parties shall be amendable to the prosecutions, fines and other penalties as provided for in this Act: *Provided*, that no such guaranty shall operate as a defense to prosecutions for the violation of this Act. First, if the dealer shall continue to sell after notice by the State Food Commissioner that such article is adulterated or misbranded within the meaning of this Act; second, if the dealer shall fail to preserve for the manufacturer or guarantor and deliver to him upon demand the sample left with him by the commissioner or his agent.

Section 32. *State Board of Health to Furnish Samples.*—The State Board of Health may submit to the commissioner or any of his assistants samples of food or drink for examination or analysis, and shall receive special reports showing the results of such examination or analysis.

Section 33. *State Analyst Shall Not Furnish Certificate of Purity.*—It shall be unlawful for the State Analyst or any assistant State Analyst to furnish to any individual, firm or corporation any certificate as to the purity or excellence of any article manufactured or sold by them to be used as food or in the preparation of food.

Section 34. *Using Shift or Device.*—The use of any shift or device to evade the provisions of this Act shall be deemed a violation of such provision and punishable as herein provided.

Section 35. *Master's Liability, etc.*—Whoever shall, by himself or another, either as principal, clerk or servant, directly or indirectly, violate any of the provisions of this Act, shall be guilty of a misdemeanor and punished as herein provided.

Section 36. *Penalties, License Fees and Proceeds Paid to State Treasurer.*—All fines, penalties, and all proceeds collected from goods confiscated and sold under the provisions of this Act and other laws relating to dairy and food products, and all license fees collected hereunder, shall be paid into the State treasury.

Section 37. *Label—Size of Type.*—The principal label on any package of food, as defined by this Act, shall be printed plainly and legibly in English with or without the foreign label in the language of the country where the product is produced or manufactured and the size of type, if not otherwise described in this Act, shall not be smaller than EIGHT-POINT (BREVIER) CAPS: *Provided*, that in case the size of the package will not permit the use of eight-point cap type, the size of the type may be reduced proportionately.

Section 38. *Food Commissioner to Make Rules and Regulations.*—The State Food Commissioner shall make rules and regulations for carrying out the provisions of this Act, and shall have power to make rules and regulations for the analyzing and reporting the results thereof, of articles submitted for analysis by the State Board of Health, and regulating the analyzing and reporting thereon of samples taken under any law or laws of the United States by any person hereunder, or furnished by any officer or employe charged with the enforcement of the laws of the United States relative to the manufacture, sale or transportation of adulterated, misbranded, poisonous or deleterious foods, dairy products or articles manufactured from dairy products or liquors.

Section 39. *Standard of Purity and Strength.*—In the enforcement of this Act, and in the construction thereof, the following named articles of food stuffs, when offered for sale or

exposed for sale, or sold, shall conform to the analytical requirements set opposite each, respectively:

Milk shall contain not less than three (3) per cent of milk fat and not less than eight and one-half (8.5) per cent of solids, not fat.

Cream shall contain not less than eighteen per cent of milk fat.

Maple Sugar shall contain not less than sixty-five one hundredths (0.65) per cent of maple ash in the water-free substance.

Honey is laevo-rotory, contains not more than twenty-five (25) per cent of water, not more than twenty-five hundredths (0.25) per cent of ash and not more than eight (8) per cent of sucrose.

Cloves shall contain not more than five (5) per cent of clove stems, not less than ten (10) per cent of volatile ether extract, not less than twelve (12) per cent of quercitannic acid, not more than eight (8) per cent of total ash, not more than five-tenths (0.5) per cent of ash insoluble in hydrochloric acid, and not more than ten (10) per cent of crude fiber.

Black Pepper shall contain not less than six (6) per cent of nonvolatile ether extract, not less than twenty-five (25) per cent of pepper starch, not more than seven (7) per cent of total ash, not more than two (2) per cent of ash insoluble in hydrochloric acid, and not more than fifteen (15) per cent of crude fiber.

Lemon Extract shall contain not less than five (5) per cent of oil of lemon by volume.

Orange Extract shall contain not less than five (5) per cent of oil of orange by volume.

Vanilla Extract shall contain in one hundred (100) cubic centimeters the soluble matters from not less than ten (10) grams of vanilla bean.

Olive Oil has a refractive index (25 degrees C.) not less than one and forty-six hundred and sixty ten thousands (1.4660) and not exceeding one and forty-six hundred and eighty ten-thousandths (1.4680), and an iodine number not less than seventy-nine (79) and not exceeding ninety (90).

All Vinegars shall contain four (4), grams of acetic acid in one hundred (100) cubic centimeters (20 degrees C.).

Cider Vinegar shall contain not less than one and one-sixth (1.6) grams of apple solids, and not less than twenty-five hundredths (0.25) grams of apple ash in one hundred (100) cubic centimeters (20 degrees C.).

Wine Vinegar shall contain not less than one (1) gram of grape solids and not less than thirteen-hundredths (0.13) gram of grape ash in one hundred cubic centimeters (20 degrees C.).

Malt Vinegar shall contain in one hundred (100) cubic centimeters (20 degrees C.) not less than two (2) grams of solids and not less than two-tenths (0.2) gram of ash.

In the enforcement of this Act and the construction thereof all articles of food not defined in this Act, when offered for sale or exposed for sale, or sold, shall conform to the definition and analytical requirements of the standard adopted and promulgated from time to time by the State Food Standard Commission: *Provided*, such standards for any article of food or drink, or for any substance used or intended to be used in food or drink shall be deemed *prima facie* evidence of the proper standard of quality, purity and strength of any such article or substance, but shall only be deemed such *prima facie* evidence in the trial of cases brought in the proper courts to enforce the provisions of this Act: *Provided*, that nothing in this section shall be construed to prevent the sale of any wholesome food product which varies from such standards, if such article of food be labeled so as to clearly indicate such variation.

Section 39a. Whoever offers for sale, exposes for sale, or sells any article of food which does not conform to the definition or analytical requirements provided for in section 39 of this Act shall be guilty of a misdemeanor and shall be punished as herein provided.

Section 40. *Preliminary Hearing by the Commissioner.*—When it appears from the examination or analysis that the provisions of this Act have been violated, the Food Commissioner



Jersey—Dick (University of Illinois.)

	Lbs. Milk.	Lbs. Fat.
1 year	8092	355

THE HISTORY
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CITY OF BOSTON.

shall cause notice of such fact together with a copy of the findings, to be given to the party or parties from whom the sample was obtained; and to the party, if any, whose name appears upon the label as manufacturer, packer, wholesaler, retailer, or other dealer, by registered mail. The receipt of the postoffice department for such registered notice shall be received as *prima facie* evidence that such notice has been given. The party, or parties, so notified, shall be given an opportunity to be heard under such rules and regulations as may be prescribed as aforesaid. Notices shall specify the date, hour and place of the hearing. The hearing shall be private, and the parties interested therein may appear in person or by attorney. If, after such hearing, the Commissioner shall believe this Act has been violated, he shall cause the party or parties whom he believes to be guilty, to be prosecuted forthwith, under the provisions of this Act. No action or prosecution shall be instituted against any person for a violation of the provisions of this Act, unless the same shall have been commenced within six months from the taking of said samples.

Section 41. *Penalty*.—Any person convicted of violating any of the provisions of the foregoing Act shall, for the first offense, be punished by a fine in any sum not less than fifteen (15) dollars, and not more than one hundred (100) dollars, or by imprisonment in the county jail not exceeding thirty days, or by such other fine and imprisonment, in the discretion of the court, and for the second and each subsequent offense by a fine of not less than twenty-five (25) dollars and not more than two hundred (200) dollars, or by imprisonment in the county jail not exceeding one year, or both, in the discretion of the court; or the fine above may be used for and recovered before any justice of the peace or any other court of competent jurisdiction in the county where the offense shall have been committed, at the instance of the State Food Commissioner or any other person in the name of the People of the State of Illinois as plaintiff and shall be recovered in an action of debt.

Section 42. *Judgment—Issuing Capias*.—When the rendition of the judgment imposes a fine as provided in any of the

sections of this Act, it shall be the duty of the justice of the peace or other court rendering such judgment also to render a judgment for costs and such justice of the peace or other court shall forthwith issue a *capias* or warrant of commitment against the body of the defendant, commanding that unless the said fine and costs be forthwith paid the defendant shall be committed to the jail of the county and the constable or other officer, to whose hands said *capias* or warrant shall come, shall in default of such payment, arrest the defendant and commit him to the jail of the county, there to remain as provided in section 171 of "An Act to revise the law in relation to criminal jurisprudence," in force July 1, 1885, unless such fine and costs shall sooner be paid.

Section 43. *Repeal*.—All Acts and parts of Acts inconsistent with this Act are hereby repealed: *Provided*, that nothing in this Act contained shall be construed as repealing the Act entitled, "An Act to regulate the manufacture and sale of substitutes for butter," approved June 14, 1897, in force July 1, 1897, or any part thereof.

Approved May 14, 1907, in force July 1, 1907.

Amendment to section 39, approved June 14, 1909, in force July 1, 1909.

Section 20a and 39a and amendments to sections 1, 3, 4, 9, 10, 11, 12, 20, 21 and 40, approved June 6, 1911, in force July 1, 1911.

Sanitary Food Law.

AN ACT to prevent the preparation, manufacture, packing, storing, or distributing of food intended for sale, or sale of food, under insanitary, unhealthful or unclean conditions or surroundings, to create a sanitary inspection, to declare that such conditions shall constitute a nuisance, and to provide for the enforcement thereof.

Section 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That every building, room, basement, inclosure or premises, occupied, used or maintained as a bakery, confectionery, cannery, packing house, slaughter house, creamery, cheese factory, restaurant, hotel, grocery, meat market, or as a factory, shop, warehouse, any public place or manufacturing establishment used for the preparation, manufacture, packing, storage, sale or distribution of any food as defined by statute, which is intended for sale, shall be properly and adequately lighted, drained, plumbed and ventilated, and shall be conducted with strict regard to the influence of such conditions upon the health of the operatives, employes, clerks, or other persons therein employed, and the purity and wholesomeness of the food therein produced, prepared, manufactured, packed, stored, sold or distributed.

Section 2. The floors, sidewalls, ceilings, furniture, receptacles, implements and machinery of every such establishment or place where such food intended for sale is produced, prepared, manufactured, packed, stored, sold or distributed, and all cars, trucks and vehicles used in the transportation of such food products, shall at no time be kept or permitted to remain in an unclean, unhealthful or insanitary condition; and for the purpose of this Act, unclean, unhealthful and insanitary conditions shall be deemed to exist if food in the process of production, preparation, manufacture, packing, storing, sale, distribution or trans-

portation is not securely protected from flies, dust, dirt, and, as far as may be necessary, by all reasonable means, from all other foreign or injurious contamination; or if the refuse, dirt or waste products subject to decomposition and fermentation incident to the manufacture, preparation, packing, storing, selling, distributing or transportation of such food are not removed daily, or if all trucks, trays, boxes, buckets or other receptacles, or the shutes, platforms, racks, tables, shelves, and knives, saws, cleavers or other utensils, or the machinery used in moving, handling, cutting, chopping, mixing, canning or other processes are not thoroughly cleaned daily; or if the clothing of operatives, employees, clerks or other persons therein employed, is unclean.

Section 3. The sidewalls and ceilings of every bakery, confectionery, creamery, cheese factory, and hotel or restaurant kitchen shall be so constructed that they can easily be kept clean; and every building, room, basement or inclosure occupied or used for the preparation, manufacture, packing, storage, sale or distribution of food shall have an impermeable floor made of cement or tile laid in cement, brick, wood or other suitable material which can be flushed and washed clean with water.

Section 4. All such factories, buildings, and other places containing food, shall be so provided with proper doors and screens adequate to prevent contamination of the product from flies.

Section 5. Every such building, room, basement, inclosure, or premises occupied, used or maintained for the production, preparation, manufacture, canning, packing, storage, sale or distribution of such food, shall have adequate and convenient toilet rooms, lavatory or lavatories. The toilet rooms shall be separate and apart from the room or rooms where the process of production, preparation, manufacture, packing, storing, canning, selling and distributing is conducted. The floors of such toilet rooms shall be of cement, tile, wood, brick or other non-absorbent material, and shall be washed and scoured daily. Such toilet or toilets shall be furnished with separate ventilating flues and pipes

discharging into soil pipes or shall be on the outside of and well removed from the building. Lavatories and wash rooms shall be adjacent to toilet rooms, or when the toilet is outside of the building, the wash room shall be near the exit to the toilet and shall be supplied with soap, running water and towels and shall be maintained in a sanitary condition.

Section 6. If any such building, room, basement, inclosure or premises occupied, used or maintained for the purposes aforesaid, or if the floors, side-walls, ceilings, furniture, receptacles, implements, appliances or machinery of any such establishment, shall be constructed, kept, maintained, or permitted to remain in a condition contrary to any of the requirements or provisions of the preceding five (5) sections of this Act, the same is hereby declared a nuisance, and any toilet, toilet room, lavatory or wash room as aforesaid, which shall be constructed, kept, maintained or permitted to remain in a condition contrary to the requirements or provisions of section five (5) of this Act, is hereby declared a nuisance; and any car, truck, or vehicle used in the moving or transportation of any food product as aforesaid, which shall be kept or permitted to remain in an unclean, unhealthful or insanitary condition is hereby declared a nuisance. Whoever unlawfully maintains, or allows or permits to exist a nuisance as herein defined shall be guilty of a misdemeanor, and, on conviction thereof, shall be punished as herein provided.

Section 7. Every person, firm or corporation operating or maintaining an establishment or place where food is produced, prepared, manufactured, packed, stored, sold or distributed shall provide the necessary cuspidors for the use of the operatives, employes, clerks, and other persons, and each cuspidor shall be thoroughly emptied and washed out daily with water or a disinfectant solution, and five ounces thereof shall be left in each cuspidor while it is in use. Whoever fails to observe the provisions of this section shall be guilty of a misdemeanor, and punished as hereinafter provided.

Section 8. No operative, employe, or other person shall expectorate on the food or on the utensils or on the floors or side-walls of any building, room, basement or cellar where the production, preparation, manufacture, packing, storing or sale of any such food is conducted. Operatives, employes, clerks, and all other persons who handle the material from which such food is prepared or the finished product, before beginning work, or after visiting toilet or toilets, shall wash their hands thoroughly in clean water. Whoever fails to observe or violates the provisions of this section shall be guilty of a misdemeanor and punished by a fine of not more than twenty-five dollars.

Section 9. It shall be unlawful for any person to sleep, or to allow or permit any person to sleep in any work room of a bake shop, kitchen, dining room, confectionery, creamery, cheese factory, or any place where food is prepared for sale, served or sold, unless all foods therein handled are at all times in hermetically sealed packages.

Section 10. It shall be unlawful for any employer to require, suffer or permit any person who is affected with any contagious or venereal disease to work, or for any person so affected to work, in a building, room, basement, inclosure, premises or vehicle occupied or used for the production, preparation, manufacture, packing, storage, sale, distribution, or transportation of food.

Section 11. It shall be the duty of the State Food Commissioner and those appointed by him to enforce this Act, and for that purpose the State Food Commissioner and his appointees shall have full power at all times to enter every such building, room, basement, inclosure or premises occupied or used or suspected of being occupied or used for the production, preparation or manufacture for sale, or the storage, sale, distribution or transportation of such food, to inspect the premises and all utensils, fixtures, furniture and machinery used as aforesaid; and if upon inspection any such food producing or distributing establishment, conveyance, or any employer, employe, clerk, driver or other person is found to be violating any of the provisions of this

Act, or if the production, preparation, manufacture, packing, storage, sale, distribution or transportation of such food is being conducted in a manner detrimental to the health of the employes and operatives, or to the character or quality of the food therein being produced, manufactured, packed, stored, sold, distributed or conveyed, the officer or inspector making the inspection or examination shall report such conditions and violations to the State Food Commissioner. The State Food Commissioner or the Assistant Commissioner shall thereupon issue a written order to the person, firm or corporation responsible for the violation or condition aforesaid to abate such condition or violation or to make such changes or improvements as may be necessary to abate them, within such reasonable time as may be required in which to abate them. Notice of such order may be served by delivering or by sending a copy thereof by registered mail, and the receipt thereof through the postoffice shall be *prima facie* evidence that notice of said order has been received. Such person, firm or corporation shall have the right to appear in person or by attorney before the State Food Commissioner, or the person appointed by him for such purpose, within the time limited in the order, and shall be given an opportunity to be heard and to show why such order or instructions should not be obeyed. Such hearing shall be under such rules and regulations as may be prescribed by the State Food Commissioner. If after such hearing it shall appear that the provisions or requirements of this Act have not been violated, said order shall be rescinded. If it shall appear that the requirements or provisions of this Act are being violated, and that the person, firm or corporation notified as aforesaid is responsible therefor, said previous order shall be confirmed or amended, as the facts shall warrant, and shall thereupon be final, but such additional time as is necessary may be granted within which to comply with said final order. If such person, firm or corporation is not present or represented when such final order is made, notice thereof shall be given as above provided. On failure of the party or parties to comply with the first order

of the State Food Commissioner within the time prescribed, when no hearing is demanded, or upon failure to comply with the final order, within the time specified, the State Food Commissioner shall certify the facts to the State's Attorney of the county in which such violation occurred, and such State's Attorney shall proceed against the party or parties for the fines and penalties provided by this Act, and also for the abatement of the nuisance: *Provided*, that the proceedings herein prescribed for the abatement of nuisances as defined in this Act shall not in any manner relieve the violator from prosecution in the first instance for every such violation, nor from the penalties for such violation prescribed by section 13 of this Act.

Section 12. All fines collected under the provisions of this Act shall be paid into the county treasury of the county in which the prosecution is brought, and it shall be the duty of the State's Attorneys in the respective counties to prosecute all persons violating or refusing to obey the provisions of this Act.

Section 13. Whoever violates any of the provisions of this Act, or who refuses to comply with any lawful order or requirement of the State Food Commissioner, duly made in writing as provided in section 11 of this Act, shall be guilty of a misdemeanor and on conviction shall be punished for the first offense by a fine of not less than ten dollars (\$10.00) nor more than two hundred dollars (\$200.00), and for the second and subsequent offenses by a fine of not less than fifty dollars (\$50.00) nor more than two hundred dollars (\$200.00), or by imprisonment in the county jail for not more than ninety days, or both, in the discretion of the court; and each day after the expiration of the time limit for abating insanitary conditions and completing improvements to abate such conditions, as ordered by the State Food Commissioner, as aforesaid, shall constitute a distinct and separate offense.

Section 14. All Acts and parts of Acts in conflict with the provisions of this Act are hereby repealed.

Approved June 5, 1911. In force July 1, 1911.

Oleomargarine Law.

AN ACT to regulate the manufacture and sale of substitutes for butter.

Section 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That for the purpose of this Act, every article, substitute or compound or any other than (that) which is produced from pure milk or cream therefrom, made in the semblance of butter and designed to be used as a substitute for butter made from pure milk or its cream, is hereby declared to be imitation butter: *Provided*, that the use of salt and harmless coloring matter for coloring the product of pure milk or cream shall not be construed to render such product an imitation.

Section 2. No person shall coat, powder or color with annatto or any coloring matter whatever, any substances designed as a substitute for butter, whereby such substitute or product so colored or compounded shall be made to resemble butter, the product of the dairy.

No person shall combine any animal fat or vegetable oil or other substance with butter, or combine therewith, or with animal fat or vegetable oil, or combination of the two, or with either one, any other substance or substances, for the purpose or with the effect of imparting thereto a yellow color or any shade of yellow so that such substitute shall resemble yellow or any shade of genuine yellow butter, nor introduce any such coloring matter or such substance or substances into any of the articles of which the same is composed: *Provided*, nothing in this Act shall be construed to prohibit the use of salt, rennet and harmless coloring matter for coloring the products of pure milk or cream from the same.

No person shall, by himself, his agents, or employes produce or manufacture any substance in imitation, or semblance of natu-

ral butter, nor sell nor keep for sale, nor offer for sale any imitation butter, made or manufactured, compounded or produced in violation of this section, whether such imitation butter shall be made or produced in this State or elsewhere.

This section shall not be construed to prohibit the manufacture and sale, under the regulations hereinafter provided, of substances designed to be used, as a substitute for butter and not manufactured or colored as herein provided.

Section 3. Every person who lawfully manufactures any substances designed to be used as a substitute for butter, shall mark for branding, stamping or stenciling upon the top or side of each box, tub, firkin or other package in which such article shall be kept, and in which it shall be removed from the place where it is produced, in a clear and durable manner in the English language, the word "oleomargarine," or the word "butterine," or the words "substitute for butter," or the words "imitation butter," in printed letters in plain roman type, each of which shall not be less than three-quarters of an inch in length.

Section 4. It shall be unlawful to sell or offer for sale any imitation butter without informing the purchaser thereof, or the person or persons to whom the same is offered for sale, that the substance sold or offered for sale is imitation butter.

Section 5. No person, by himself or others, shall ship, consign or forward by any common carrier, whether public or private, any substance designed to be used as a substitute for butter unless it shall be marked or branded on each tub, box, firkin, jar or other package containing the same, as provided in this Act, and unless it be consigned by the carriers and receipted for by its true name: *Provided*, that this Act shall not apply to any goods in transit between foreign states across the State of Illinois.

Section 6. No person shall have in his possession or under his control any substance designed to be used as a substitute for butter, unless the tub, firkin, jar, box or other package containing the same be clearly and durably marked as provided in this Act: *Provided*, that this section shall not be deemed to apply

to any persons who have the same in their possession for the actual consumption of themselves (or) their families. Every person who shall have possession or control of any imitation butter for the purpose of selling the same which is not marked as required by the provisions of this Act, shall be presumed to have known during the time of such possession or control the true character and name, as fixed by this Act, of such product.

Section 7. Whoever shall have possession or control of any imitation butter or any substance designed to be used as a substitute for butter, contrary to the provisions of this Act, for the purpose of selling the same, or offering the same for sale shall be held to have possession of such property with intent to use it in violation of this Act.

Section 8. No action shall be maintained on account of any sale or contract made in violation of, or with intent to violate, this Act, by or through any person who was knowingly a party to such wrongful sale or contract.

Section 9. Whoever shall deface, erase or remove any mark provided by this Act, with intent to mislead, deceive, or to violate any of the provisions of this Act, shall be guilty of a misdemeanor.

Section 10. Whoever shall violate any of the provisions of this Act shall be punished by a fine of not less than \$50 nor more than \$200, or by imprisonment in the county jail not to exceed 60 days for each offense, or by both fine and imprisonment, in the discretion of the court, or the fine alone may be sued for and recovered before any justice of the peace in the county where the offense shall be committed, at the instance of any person in the name of the People of the State of Illinois as plaintiff.

Section 11. It is hereby made the duty of the State's Attorney of each county in this State to prosecute all violations of this Act upon complaint of any person, and there shall be taxed as his fees in the case the sum of ten dollars (\$10), which shall be taxed as costs in the case.

Approved June 14, 1897, in force July 1, 197.

Stock Food Law.

(As Amended in 1911.)

AN ACT to regulate the sale and analysis of concentrated feeding stuffs.

Section 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* Every lot or parcel of concentrated commercial feed stuffs, as defined in section 2 of this Act, used for feeding farm live stock, sold or offered or exposed for sale within this State, shall have affixed thereto, in a conspicuous place on the outside thereof, a plainly printed statement in the English language clearly and truly certifying:

(a) The net weight of the contents of the package, lot or parcel;

(b) The name, brand or trade mark;

(c) The name and principal address of the manufacturer or the person responsible for placing the commodity on the market;

(d) The minimum per centum of crude protein; the maximum per centum of crude fat; and the maximum per centum of crude fibre; (to be determined by the methods adopted by the Association of Official Agricultural Chemists of the United States.)

(e) The specific name of each ingredient used in its manufacture. A copy of said statement shall be filed with the State Food Commissioner on or before January 10th of each year.

If the feed stuff is sold in bulk, or if it is put up in packages belonging to the purchaser, the agent or dealer shall, upon the request of the purchaser, furnish him with the certified statement described in this section.

Section 2. The term "concentrated commercial feed stuff," as used in this Act, shall include cotton seed meals, linseed meals,

pea meals, bean meals, peanut meals, cocoanut meals, gluten meals, gluten feeds, maize feeds, starch feeds, sugar feeds, sucrene feeds, and all oil meals of all kinds, dried distillers' grains, dried brewers' grains, dried beef refuse, rice meals, oat meals, oat feeds, corn and oat feeds, corn, oat and barley feeds, chop feeds, corn bran, ground beef or fish, scraps, meat and bone meals, mixed feeds, except as otherwise provided in section 3 of this Act—clover and alfalfa meals, any mixture of any of the before mentioned substances with each other or with any other substance, condimental stock and poultry foods, medicinal stock and poultry foods consisting of or containing any of the substances included as concentrated commercial feed stuff as defined by this section, patented, proprietary or trade-marked stock and poultry foods, and all other materials of a similar nature intended for stock or poultry, not included in section 3 of this Act.

Section 3. The term "concentrated commercial feed stuffs," as used in this Act shall not include hays and straws, the whole seeds nor the unmixed meals made directly from the entire grains of wheat, rye, barley, oats, Indian corn, buckwheat and broom corn. Neither shall it include wheat bran or wheat middlings not mixed with other substances, but sold separately as distinct articles of commerce, nor wheat bran and wheat middlings mixed together, not mixed with any other substance, and known in the trade as "mixed feed," nor pure grains ground together unmixed with other substances.

Section 4. Any manufacturer, importer, agent or other person selling, offering or exposing for sale any concentrated feed stuffs included in section 2 of this Act, without the printed statement required by section 1 of this Act, or with a label stating that the said feed stuffs contains substantially a larger percentage of either crude protein or crude fat than is actually present therein, shall be fined fifty dollars (\$50.00) for the first offense and one hundred dollars (\$100.00) for each subsequent offense.

Section 5. The State Food Commissioner is hereby author-

ized, in person or by deputy, to enter any premises where feed stuffs are stored and to take a sample not exceeding two pounds in weight, from any lot or package of any commercial feed stuff used for feeding any kind of farm live stock or poultry, as defined in section 2 or of excepted materials named in section 3 of this Act, which may be in possession of any manufacturer, importer, agent or dealer. Any sample so taken shall be put in a suitable vessel and a label signed by the State Food Commissioner or his deputy, placed on or within the vessel, stating the name or brand of the feed stuff or material sampled, the guaranty, the name of the manufacturer, importer or dealer, the name of the person, firm or corporation from whose stock the sample was taken, and the date and place of taking: *Provided, however,* that whenever a request to that effect is made the sample shall be taken in duplicate and carefully sealed in the presence of the person or persons of interest, or their representative, in which case one of the said duplicate samples shall be signed and retained by the person or persons whose stock was sampled. Any person who shall obstruct the State Food Commissioner or his deputy while in the discharge of his duty under this Act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than twenty-five dollars (\$25.00) nor more than one hundred dollars (\$100.00) for each offense. The aforesaid State Food Commissioner shall cause at least one analysis of each food stuff collected as herein provided to be made annually. Said analysis shall include the determinations of crude protein, of crude fat, and crude fiber, and of such other ingredients as it is deemed advisable at any time to determine. Said State Food Commissioner shall cause the results of the analysis of the sample to be furnished the Agricultural Experiment Station from time to time to be published in annual bulletins or special circulars, together with such additional information concerning the character, composition and use thereof as circumstances may require.

Section 6. Any person who shall adulterate any whole or ground grain with milling or manufacturing offals, or with any

foreign substance whatever, or adulterate any bran or middlings or mixtures of wheat bran or wheat middlings known in the trade as "mixed feed," or any other standard by-product made from the several grains or seeds with any foreign substance whatever, for the purpose of sale, unless the true composition, mixture or adulteration thereof is plainly marked or indicated upon the package containing the same or in which it is offered for sale and any person who knowingly sells or offers for sale any whole or ground grain, bran or middlings, or mixture of wheat bran and wheat middlings known in the trade as "mixed feed," or other standard by-product, which has been so adulterated, unless the true composition, mixture or adulteration is plainly marked or indicated upon the package (containing) the same or in which it is offered for sale, shall on conviction, be fined not less than twenty-five dollars (\$25.00) nor more than one hundred dollars (\$100.00) for each offense and such fines shall be paid into the treasury of the State.

Section 7. It shall be the duty of the State Food Commissioner to presecute the person or persons violating any provisions of this Act, and for this purpose the State Food Commissioner may, if necessary, employ experts, and may further designate some person connected with his office, or some other suitable person, to make complaints in his behalf; and in making complaints for violation of this Act the person so designated shall not be required to enter any recognizance or to give security for the payment of costs: *Provided, however,* that there shall be no prosecution in relation to the quality of any unadulterated commercial feed stuff if the same shall be found to be substantially equivalent to the statement of analysis made by the manufacturers or importers.

Section 8. Each manufacturer, importer, agent or seller of any concentrated commercial feeding stuffs shall pay annually, during the month of December, to the Treasurer of the State of Illinois a license fee of twenty-five dollars (\$25.00) for each and every brand sold or offered for sale. Whenever a manu-

facturer, importer, agent or seller of concentrated commercial feeding stuffs desires at any time to sell such material and has not paid his license fee therefor in the preceding month of December, as required by this section, he shall pay the license fee prescribed herein before making any such sale. Said treasurer shall in each case at once certify to the State Food Commissioner the payment of such license fee. Each manufacturer, importer or person who has complied with the provisions of this article shall be entitled to receive a certificate from the State Food Commissioner setting forth said facts. The license fees received by the State Treasurer pursuant to the provisions of this section shall constitute a special fund from which to defray the expenses incurred in making the inspections and the analysis required by this Act, and enforcing the provisions thereof, and he shall report annually the amount received and the expense incurred for salaries, laboratory expenses, chemical supplies, traveling expenses, printing and other necessary matters. Whenever the manufacturer, importer or shipper of concentrated commercial feeding stuffs shall have filed the statement required by section 7 of this Act and paid the license fee as prescribed in this section, no agent or seller of such manufacturer, importer or shipper shall be required to file such statement or pay such fee.

Section 9. This Act shall not affect persons manufacturing, importing or purchasing feed stuffs for their own use and not to sell in this State.

Section 10. The term "importer," for all the purposes of this Act, shall be taken to include all who procure or sell concentrated commercial feed stuffs.

Section 11. When the rendition of a judgment imposes a fine as provided in any of the sections of this Act, it shall be the duty of the justice of the peace or other court rendering such judgment also to render a judgment for costs, and such justice of the peace or other court shall forthwith issue a capias or warrant of commitment against the body of the defendant commanding that unless the said fine and costs be forthwith paid, the de-

fendant shall be committed to the jail of the county, and the constable or other officer to whose hands said capias or warrant shall come, shall in default of such payment arrest the defendant and commit him to the jail of the county, there to remain as provided by section 171 of "An Act to revise the law in relation to criminal jurisprudence," in force July 1, 1895, unless such fine and costs shall sooner be paid.

Section 12. All Acts and parts of Acts inconsistent with this Act, be and they are hereby repealed.

Approved May 18, 1905, in force July 1, 1905. Amendments to sections 1 and 2 approved June 2, 1911, in force July 1, 1911.



Four Systems of Dairy Farming.

By

Wilber J. Fraser, Chief in Dairy Husbandry and Royden E. Brand, Assistant in Dairy Husbandry, University of Illinois.

The amount of milk and butter fat produced per acre is, generally speaking, the final test of profitable dairying where all feed is raised on the farm. The final resultant depends not only on efficient cows but also on raising crops that contain a maximum amount of digestible nutrients, and especially protein, which is so essential for dairy cows. This circular explains and compares four different systems of cropping for dairy farms. The first will make 991 pounds; the second, 1,475 pounds; the third, 2,025 pounds; and the fourth, 3,150 pounds of milk per acre. The poorest system of cropping returns \$15.20 per acre in milk, and the best system returns \$48.30 per acre. The first system will give an annual return of \$2,632 from a 160-acre farm, and the last, \$8,263, or more than three times the first.

But this is not all. The fertility of the farm is diminished by the first system, as there is an annual loss of 1,900 pounds of nitrogen. The second system shows 110 pounds, the third, 2,280 pounds, and the fourth, 5,830 pounds increase of nitrogen in the soil. These differences are due entirely to the kind of crops raised and their adaptability to the feeding of dairy cows, for the cows are figured as of the same natural efficiency and the soil equally productive, in each of the four systems. It is certainly worth while to consider crop plans that make such differences in the returns and in the maintenance of the soil.

Several Reasons for Poor Results.

The investigations of the Department of Dairy Husbandry during the past dozen years show plainly that the dairy farmers are not getting the profits they should and could get for the investment of their time and money. There are several reasons for the poor results so frequently obtained. One is inefficient cows, and the Department has done much investigating to show the difference in efficiency of individual cows, and has published the striking results. Another reason is the great waste in raising crops that do not yield anything like the maximum amount of digestible nutrients per acre. This is especially true in regard to the protein contained in the crops commonly raised on the dairy farm and so essential in the ration for dairy cows. For example, an acre of timothy hay does not contain more than one-tenth as much digestible protein as an acre of alfalfa hay. Notwithstanding this fact, timothy hay is still extensively grown on many dairy farms and fed to dairy cows.

Conditions Found in Dairy Sections.

A few examples may help to bring out the conditions existing in the dairy sections of Illinois. Not long since the writer visited a large dairy farm in the Elgin district, where the tenant had been on the farm for 14 years without sowing clover or other legume seed during this time, thus showing the same defect as in System No. 1. Just across the road was a large dairy farm on which ten acres of clover were grown. In March this man still had the clover hay in his barn and was inquiring for a market where he might dispose of it, as he said he had so much corn stover he could not feed it out before time to turn the cows to pasture. He made a gross mistake in not feeding this legume hay, which would have taken the place of much of the high-priced bran which he had been buying in large quantities all winter in an attempt to balance the ration for his dairy herd.

Why This Circular Is Written.

Since there are many dairy farms in Illinois that approach these conditions, where the farmers attempt to go into dairying by simply putting cows on the farm without changing the crops raised and continue indefinitely without attempting to adapt the crops raised to the best ration for a dairy herd, it has been thought wise to show a comparison of results—the relative efficiency—of different systems of cropping on dairy farms. This has been done by comparing the amounts of nutrients produced annually by the different crops in the various systems. From the results thus obtained has been determined the average amount of milk that can be produced by feeding the crops to good dairy cows under ordinary farm conditions. Four different systems of cropping have been compared, using, in each case, 160 acres of good land and producing all of the feed on the farm, as this is the only way to make the four systems comparable.

To indicate actual tested results as found by the Experiment Station in a full years record, six dairy farms in the Elgin district of from 151 to 350 acres, carrying from 43 to 80 cows which were much alike in production, yielded the following respective amounts of milk per acre: 994 pounds, 1,137 pounds, 1,341 pounds, 1,382 pounds, 1,412 pounds and 2,145 pounds. Only one of these farms compares favorably with the third best of the four systems described in this circular, and it produced only about two-thirds as much milk per acre as the corn and alfalfa system. It must also be considered that on these farms large amounts of commercial feeds were purchased.

The Four Systems of Cropping.

Four acres of every quarter section as called for in the deed are used for public highways, and another four acres is allowed for buildings and yards, leaving 152 acres for actual cultivation. If this were in eight equal fields, each would contain 19 acres, hence the unusual numbers of acres in this divis-

ion of the farm. There would of course be some change in the position of the crops each year. The crops raised and the rotation practiced under each system are as follows:

System No. 1.—Corn, oats, corn, oats, timothy, pasture, pasture, pasture.

System No. 2.—Corn, corn, corn, oats, clover, clover, clover and timothy, pasture, pasture.

System No. 3.—Corn, corn, corn, oats, clover, alfalfa, pasture, pasture.

System No. 4.—Corn, corn, corn, corn, corn, alfalfa, alfalfa, alfalfa. The comparisons to be made here in detail show what one going into the dairy business may reasonably expect to accomplish from each of these systems, and they should be of even greater value to established dairymen by pointing out the great advantage of raising the proper crops and adopting a good system of rotation, especially one containing a large acreage of legumes, preferably alfalfa, and also a large acreage of corn for the silo.

Figuring the Same Yields in Four Systems.

The entire farm in each case has been figured as tillable, and all the land of good quality and well-drained. However, the larger the proportion of unfillable land in a farm, the more important it is that the tillable area be devoted to intensive systems of cropping. In order to have the systems of farming on the same basis, the crop yields are the same for all systems. No attempt is herein made to exhibit phenomenal or impossible results, as the yields have been fixed as nearly as possible at the average production per acre on the better class of farms in Illinois, as follows:

TABLE 1.—Yields of Crops Raised, Bushels, Pounds and Digestible Nutrients Per Acre.*.

Crop	Yield per acre		Digestible nutrients				
	Amount	Pounds	Prot. Total	Carbo. Total	Fat x 2.25	Total	Total per crop
Oats (grain)...	50 bu.	1600	147	757	151	1055	
Oat straw....	1600 lb.	1600	19	618	29	666	
			166	1375	180	1721	
Corn (grain).	55 bu.	3080	240	2054	297	2591	
Corn Stover.	2 T.	4000	68	1296	63	1427	
			308	3350	360	4018	
Timothy hay..	1½ T.	3000	84	1302	95	1481	
Clover hay....	2½ T.	5000	340	1790	191	2321	
Alfalfa hay....	4 T.	8000	880	3168	216	4264	
Pasture z .....	.....	.....	160	585	101	846	

From the compositions as given above is derived the comparative production of food value of the four systems of cropping for dairy purposes, as tabulated in Table 2.

TABLE 2.—Relative Amounts of Available Digestible Nutrients Produced Annually on a 160-Acre Farm by Each of the Four Systems.

System	Protein	Carbohydrate	Fat x 2.25	Total Nutrients
No. 1	26,804	192,460	25,918	245,182
No. 2	35,024	255,479	31,856	322,359
No. 3.	48,850	296,204	34,072	379,126
No. 4.	80,237	491,249	46,244	617,730

* Dairymen who have farms less productive, or who for any reason get smaller yields, must scale down the final results in proportion to the crops obtained, and those who can produce greater yields should raise the results proportionately.

z The amount of digestible nutrients produced per acre by pasture grass was determined by averaging all of the available data upon this subject.

This shows in a striking manner the inefficiency of System No. 1, because of the comparatively large acreage devoted to crops yielding a small amount of nutrients per acre. In striking contrast to this is the great amount of nutrients produced by System No. 4, devoted to corn and alfalfa, the protein being three times, and the total nutrients $2\frac{1}{2}$ times that produced by System No. 1. Systems No. 2 and No. 3 are intermediate between these and show how a dairyman may by a mere change of cropping gradually work his way from the first to the fourth system if a sudden change is thought too radical. System No. 4 requires more labor, but where this can be obtained and used to advantage this system will be increasingly profitable as land becomes higher priced.

The figures here shown do not tell the full story; for the poorer rotation will gradually run down the land so that it will produce smaller yields, while with the better rotations the land will tend to increase in producing power, growing larger crops than are here estimated and thereby increasing the pounds of milk and profit per acre year after year.

Poor Feed Lowers Production; Just Basis.

As the main object is to show approximately the amount of milk which can be produced per acre under each of the different systems, it is essential that a definite basis of production per cow be used, and for this purpose in all cases there are taken good grade cows, weighing 1100 pounds, that will produce an average of 6000 pounds of 4-percent milk a year when well fed on a balanced ration such as can be produced by Systems No. 3 and No. 4. Under System No. 1 cows of this efficiency would produce only approximately 5000 pounds of milk in a year when fed on the unpalatable and unbalanced ration inevitably furnished by this system. This is not only because the cows would be in poorer physical condition, but because they would consume less of these feeds. Cows of this efficiency would produce approximately 5500 pounds of milk in a year when fed on a ration made of feeds raised under System No. 2. It must

be borne in mind that in figuring the amount of milk produced per acre under Systems No. 1 and No. 2, the cows are in each case charged with only the amount of feed required to produce the respective amounts of milk, and that the cows are not all fed the same amount of nutrients regardless of their production.

In each system the cows are allowed to go dry 60 days, which covers the time until the milk is good. To make allowance for the nutrients required to grow the foetus, the ration as figured for the last four months of milk production is continued during the dry time.

All Feed Produced on the Farm; Other Conditions.

To put the systems on the same basis, all the feed is produced on the farm, and nothing but milk, old cows, and surplus calves are sold. Good pure bred sires are kept and the herds are made self-sustaining by raising enough heifers from the best cows to keep up the milking stock. As cows will produce, on the average, for six years, this means that one-sixth as many heifers must be raised each year as there are cows in the herd. In the calculations that follow it is figured that the feed for one cow for one year will be sufficient to raise a heifer from birth to freshening at $2\frac{1}{2}$ years of age.

One-sixth of the cows in the herd are to be sold each year and these would bring an average price of twenty-five dollars. The surplus calves to be sold at three dollars each, for veal, would number ninety per cent of the cows in the herd minus heifers that must be raised to supply the herd with cows.

No allowance is made for transporting the product. At the present time milk or cream is frequently gathered by haulers, but where the product is transported by the producer, the distance varies greatly, and it is the best for each one hauling his product to make this allowance to suit the individual case.

The farm is figured as rectangular, with the buildings centrally located. If the farm is ill shaped, so that the work cannot

be done so conveniently, more horses than here figured will be required.

Horses Required for Each System.

Four 1300-pound horses will be required in System No. 1; five in System No. 2; five in System No. 3; and six in System No. 4; and a certain amount of land will be needed in each case to support the horses. In the first three systems an allowance of one-fourth of an acre of pasture is made for each horse. The horses are all fed grain $10\frac{1}{2}$ months and roughing 12 months in the year—15 pounds of grain and 13 pounds of hay per horse per day.

How Many Cows Can Be Kept; Their Rations.

To determine the number of cows that can be kept on the farm under each of the separate systems, the first step is to know the amount and kind of rations needed and the length of time each should be fed. Under ordinary conditions cows give a greater yield of milk per year when freshening in the fall, and the management of the herds under all these systems of cropping is based upon cows freshening at this season of the year. The winter rations are therefore figured for the first portion of the lactation period. If some cows freshen in the spring, a portion of the grain here allowed for the winter ration of such cows will not be needed at that time and can be fed during the summer, as those freshening in the spring will be giving less milk during the winter.

SYSTEM NO. 1, 32 COWS, 991 POUNDS OF MILK PER ACRE.

System No. 1 is an eight-year rotation of corn, oats, corn, oats, timothy, pasture, pasture, pasture, with 38 acres each of corn and oats, 19 acres of timothy and 57 acres of pasture.

Feeding each of the four horses 6 2-3 pounds of oats and 8 1-3 pounds of corn for $10\frac{1}{2}$ months, and 13 pounds of hay

per day for 12 months, it is found that they require 5.24 acres oats, 3.4 acres corn, 6.24 acres timothy and one acre pasture—15.88 acres in all. When this and the 8 acres in roads and yards are taken from the farm, 136.12 acres are left available for dairy stock—34.6 acres corn, 32.76 acres oats, 12.76 acres timothy and 56 acres pasture.

On a ration composed of the feeds available on this farm, the cows will produce approximately 5000 pounds of milk each year. To do this, the cows would have to produce, on the average, 20 pounds of milk per day during the winter six months and 11 pounds of milk per day during the summer six months.

During the 182 days from May 10, when the cows are turned to pasture, to November 10, when given a full winter ration in the barn, they should receive digestible nutrients as follows:

Required Nutrients for an 1100-Pound Cow Producing 11 Pounds of Milk Per Day.

		Protein	Carbohydrate	Fat
Pounds nutrients	1 day	1.29	10.08	.29
Pounds nutrients	182 days	235.	1835.	53.

The pasture must be supplemented with green oats and corn from about July 1 to November 10, making 130 days feeding. Allowing 50 pounds of green oats per day for 30 days, requires 1500 pounds of oats, or .1 of an acre of oats per cow, and allowing 60 pounds of green corn or its equivalent per cow per day for 100 days, requires 6000 pounds of green corn, or .25 of an acre per cow. With this supplementary feed 56 acres of pasture will support approximately 38 head of cows and allow each animal 1.47 acres.

TABLE 3.—Area of Different Crops and Digestible Nutrients Required To Support a Cow the Summer Six Months.

CROP	Pounds	Digestible nutrients			Acres required	
		Protein	Carbo- hydrate	Fat	For one cow	For 38 cows
Pasture		235	860	66	1.47	56.
* Green oats	1500	15	106	7	.1	3.8
z Green corn	6000	54	678	42	.25	9.5
Corn (grain)	182	15	122	8	.06	2.28
Total		319	1766	123	1.88	71.58
Nutrients required for one cow producing 11 lbs. milk daily for 182 days						
		235	1835	53	....	.....

It will be noted that the protein allowed in the feed exceeds that required, but where the cows are kept on mixed pasture during the summer the protein is in excess unless the cows are giving a large flow of milk.

In this system 1.47 acres of pasture are allowed per cow, and the 56 acres available will support 38 cows. Since it requires .1 of an acre of oats and .31 of an acre of corn per cow to supplement the pasture, to support 38 head of cows will require 3.8 acres of oats and 11.78 acres of corn, making a total of 71.58 acres of land to support the herd during the summer six months.

There are 32.76 acres of oats available for dairy stock, 3.8 acres of which are used for soiling and 28.96 acres for winter feeding. There are 34.6 acres of corn available for dairy stock, 11.78 acres of which are used for soiling and 22.82 acres for winter feeding.

* Green oats are figured as yielding 15,000 pounds per acre. The digestible nutrients are figured as including all grain and one-half straw consumed, the analysis of the dry grain and straw being the basis.

z Green corn and corn silage are figured as yielding 12 tons per acre, and the digestible nutrients are figured from the average composition of silage given in Henry's Feeds and Feeding.

TABLE 4.—Acres and Pounds of Each Crop Available for Dairy Stock During the Winter Six Months.

Crop	Acres	Pounds
Corn	22.82	Stover 91,280
Oats	28.96	Grain 70,285
Timothy	12.76	Grain 46,336
		Hay 38,280

During the winter six months, when the cows are on dry feed, they should produce, on the average, 20 pounds of milk per day. Most dairymen who practice this rotation feed all cows in milk practically the same ration, so that for 183 days on winter feed but one ration, which is given below, has been figured to cover the average production of 20 pounds of milk per day for that period.

Ration No. 1.

FEED	Pounds		Digestible nutrients			Nutritive Ratio
	Fed	Eaten	Protein	Carbo-hydrate	Fat	
Corn stover 14	.8	.14	2.59	.06		
Timothy hay	5.5	.15	2.38	.07		
Corn meal	9.5	.75	6.34	.41		
Oats	6.5	.60	3.07	.27		
Total .....	....	1.64	14.38	.81		1:9.8
Nutrients required for 1100-lb. cow producing 20 lbs. milk daily .....	....	1.70	12.02	.43		.....

TABLE 5.—Pounds and Acreage of Crops for 183 Days Winter Feeding.

CROP	Pounds fed	Pounns per cow	Aeres per cow	Acres or 58 cows	Acres Available	Surplus or shortage
Corn stover	14	2562	.64	24.32	22.82	1.50
Timothy	5.5	1006	.33	12.54	12.76	.22
Corn meal	9.5	1739	.57	21.66	22.82	1.16
Oats	6.5	1190	.75	28.50	28.96	.46
Total acres required for the winter six months.....			1.72	65.36	.....	.....

As before stated, it takes 1.88 acres to keep a cow during the summer six months and 1.72 acres during the winter six months—a total of 3.60 acres per cow per year. Thus 135.42 acres will support a herd of 38 cows.

TABLE 6.—Acres of Each Crop Used for Different Purposes.

	Corn	Oats	Timothy	Pasture
Horses	3.40	5.24	6.24	1.00
Cows. { Stover	24.32		12.54	56.00
{ Green	9.5	3.8		
{ Grain	(23.94)	28.5		
Total	37.22	37.54	18.78	57.00
Available	38	38	19	57
Surplus stover	.88	.46	.22	
Surplus grain	1.16			

This sized herd would require one bull, and an average of 5.3 heifers must be raised each year to replenish the herd. There could then be supported 31.7 milk cows after deducting the feed consumed by the bull and heifers. This number, producing an average of 5000 pounds of milk per year, would make a total of 158,500 pounds, or an average of 991 pounds of milk per acre.

SYSTEM NO. 2, 43 Cows, 1475 POUNDS MILK PER ACRE.

The rotation and crops raised in this system are corn, corn, corn, oats, clover, clover and timothy, pasture, pasture, with 57 acres of corn, 19 acres each of oats, clover, clover and timothy, and 38 acres of pasture. The feed per horse is exactly the same as in System No. 1, except that only 1.17 acres of clover and timothy are needed; the five horses consume the crops from 17.90 acres, and there remains available for dairy stock 52.75 acres corn, 12.45 acres oats, 19 acres clover, 13.15 acres clover and timothy, and 36.75 acres pasture.

Cows that would produce 6000 pounds of milk on a ration composed of corn silage and legume hay with grain, would not produce over 5500 pounds on the feed available on this farm. During the summer six months, or 182 days, from May 10 to November 10, the cows would have to produce, on the average, 12 pounds of milk per day for 122 days, allowing 60 days to be dry.

During this time they should receive digestible nutrients as follows:

Required Nutrients for an 1100-Pound Cow Producing 12 Pounds of Milk Per Day.

		Protein	Carbohy- drate	Fat
Pounds nutrients	1 day	1.33	10.29	.30
Pounds nutrients	182 days	242.	1873.	55.

The pasture must be supplemented with green oats and corn from about July 1 to November 10—70 pounds of green oats per cow per day for 30 days, and 70 pounds of green corn or its equivalent per cow per day for 100 days. With this supplementary feed 36.75 acres of pasture will support approximately 51 head of cows and allow each animal .72 of an acre of pasture.

TABLE 7.—Area of Different Crops and Digestible Nutrients Required To Support a Cow the Summer Six Months.

CROP	Pounds	Digestible nutrients			Acres required	
		Protein	Carbo- hydrate	Fat	For one cow	For 51 cows
Pasture		115	421	32	.72	36.72
Green oats	2100	22	149	10	.14	7.14
Green corn	7000	96	946	51	.35	17.85
Corn Meal	274	21	182	12	.09	4.56
Clover hay	364	25	130	6	.07	3.57
Total		279	1828	111	1.37	69.87
Nutrients required for one cow						
182 days		242	1873	55	....	.....

The protein and fat allowed in the feed exceed that required and the carbohydrate is slightly deficient.

A total of 69.87 acres is required to support the herd during the summer six months. During the winter six months, when the cows are on dry feed, they should produce an average of 22 pounds of milk per day and the one ration given below must be fed this 183 days.

Ration No. 2.

FEED	Pounds		Digestible nutrients			Nutritive ratio
	Fed	Eaten	Protein	Carbo- hydrate	Fat	
Corn stover	12	6	.10	1.94	.04	
Clover hay		8	.54	2.86	.14	
Clover and timothy hay....		5	.27	2.18	.09	
Corn meal		9.05	.75	6.33	.41	
Oats		1.05	.09	.47	.04	
Total nutrients .....		....	1.75	13.78	.72	1:8.8
Nutrients required for 1100-lb. cow producing 22 pounds milk daily						
		....	1.79	12.45	.46	.....

There is some waste in carbohydrate, but this cannot be **prevented with the crops** grown in this rotation, and it is in keeping with the practice on many of our dairy farms during the winter. The acreage in crops per cow for the winter six months will then be as follows:

TABLE 8.—Pounds and Acreage of Crops for Winter Six Months.

FEED	Pounds fed	Pounds per cow	Acres per cow	Acres 51 cows	Acres available	Surplus or shortage
Corn Stover	12	2196	.55	28.05	30.3	2.25 (bedding)
Clover hay	8	1464	.3	15.3	15.43	.13
Clover & timothy hay	5.5	1006	.25	12.75	13.15	.40
Corn meal	9.5	1738	.56	28.76	30.3	1.54
Ground oats	1	183	.11	5.61	5.3	— .31
Total acres required for winter six months			1.23	62.73	....	....

As shown in the tables, it requires 1.37 acres to support a cow during the summer six months and 1.23 acres during the winter six months, or 2.6 acres to support a cow a year, and 134.1 acres will support a herd of 51 cows.

A herd of this size would require one bull, and an average of 7.1 heifers must be raised each year to replenish the herd. There could then be supported by this system 42.9 milch cows producing an average of 5500 pounds of milk per year, or a total of 235,950 pounds for the farm averaging 1475 pounds of milk per acre.

SYSTEM NO. 3, 54 COWS, 2025 POUNDS MILK PER ACRE.

The rotation of crops raised in this system are corn, corn, corn, oats, clover, pasture, pasture, with alfalfa in the rotation once in eight years, giving 57 acres to corn, 19 acres each to oats, clover and alfalfa, and 38 acres to pasture, with an additional 19 acres, corn ground, sown to rye for pasture.

Feeding each of the five horses needed under this system 13 pounds of corn per day for 10½ months and 15 pounds of clover hay per day for 12 months, it is found that they require 6.65 acres of corn, 5.4 acres of clover and 1.25 acres of pasture—13.3 acres in all. When this and the 8 acres in roads and yards are taken from the farm, 138.7 acres are left available for dairy stock—50.35 acres corn, 19 acres oats, 13.6 acres clover, 19 acres alfalfa and 36.75 acres pasture. Cows fed on rations grown in this system should produce their maximum yield, or 6000 pounds of milk per year.

During the summer six months, or 182 days, from May 10 to November 10, the cows would have to produce, on the average, 13 pounds of milk per day for 122 days, allowing 60 days to be dry.

During this time they should receive digestible nutrients as follows:

Required Nutrients for an 1100-Pound Cow Producing 13 Pounds of Milk Per Day.

				Protein	Carbohy- drate	Fat
Pounds	nutrients	.....	1 day	1.38	10.51	.32
Pounds	nutrients	.....	182 days	251.	1913.	58.

.. The pasture must be supplemented with green oats and corn silage from about July 1 to November 10; 70 pounds of green oats per cow per day for 30 days, 40 pounds of silage per cow per day for 125 days, three pounds of corn meal per cow per day for 182 days and six pounds of clover hay per day for 182 days. With this supplementary feed 36.75 acres of pasture will support approximately 65 head of cows and allow each animal .57 of an acre of pasture.

TABLE 9.—Area of Different Crops and Digestible Nutrients Required To Support a Cow the Summer Six Months.

CROP	Pounds	Digestible nutrients			Acres required	
		Protein	Carbo- hydrates	Fat	For one cow	For 65 cows
Pasture		91	333	26	.57	37.05
Green oats	2100	22	149	10	.14	9.10
Corn silage	5000	45	565	35	.21	13.65
Corn meal	548	43	370	24	.18	11.70
Clover hay	1092	74	393	19	.22	14.30
Total.....		275	1810	114	1.32	85.80
Nutrients required for one						
cow 182 days		251	1913	58	....	.....

The protein and fat allowed in the feed exceed that required and the carbohydrate is deficient, but the total nutrients exceed the requirements.

During the winter six months the cows should produce an average of 24 pounds of milk per day. The one ration given below must be fed for the winter five months, or 153 days, the cows being on green rye for an average of 30 days, when they get in addition 2 pounds of corn meal and 6 pounds of alfalfa hay per day.

Ration No. 3.

FEED	Pounds	Digestible nutrients			Nutritive ratio
		Protein	Carbo- hydrate	Fat	
Silage	40	.36	4.52	.28	
* Corn stover	1	.02	.32	.01	
Corn meal	2	.16	1.33	.09	
Oats	1½	.14	.71	.06	
Alfalfa	14	1.54	5.54	.17	
Total nutrients		2.22	12.42	.61	1:6.2
Nutrients required for 1100-lb. cow					
producing 24 lbs. milk daily.....		1.88	12.88	.49	.....

*No allowance made for corn stover as it is produced on the same area that grew the corn meal.

The carbohydrate is a little low, but the protein and fat are both high, making the total digestible nutrients in this ration in excess of the requirement..

TABLE 10.—Pounds and Acreage of Crops for the Winter Six Months.

FEED	Pounds Fed	Days Fed	Pounds per cow	Acres per cow	Acres 65 cows	Acres Available	Surplus or shortage
Corn silage	40	153	6120+5	.27	17.55	17.55	
			% waste				
Corn meal	2	183	366	.12	7.8	7.45	— .35
Oats	1.5	153	229	.14	9.1	9.9	.8
Alfalfa	(14	153	2142				
.....	(6	30	180	.29	18.85	19.	.15
Total acres required for winter six months	....	...	....	.82	53.30	.....	.....

Since it requires 1.32 acres to support a cow the summer six months and .82 acres the winter six months, it requires 2.14 acres to support a cow a year, and 138.7 acres will support a herd of 65 cows.

A herd of this size would require two bulls, and an average of 9 heifers must be raised each year to replenish the herd. There could then be supported by this system 54 milch cows producing an average of 6000 pounds of milk per year, or a total of 324,000 pounds for the farm averaging 2025 pounds of milk per acre.

SYSTEM NO. 4, 84 COWS, 3150 POUNDS OF MILK PER ACRE.

The only crops raised in this system are corn and alfalfa with rye as a catch crop for pasture, there being 95 acres of corn and 57 acres of alfalfa. The yards into which the cows are turned are included in the four acres allowed for buildings and yards.

Six 1300-pound horses will be required to do the work under this system. If each horse is fed a daily ration composed of

13 pounds of corn and 15 pounds of alfalfa hay, with the exception of a six weeks' rest period during the winter, when no grain is fed*, they will consume 7.98 acres of corn and 4.05 acres of alfalfa, or 12.03 acres in all. To this 12.03 acres add 8 acres required for roads, yards, etc., making 20.03 acres to be taken from the farm for these purposes. This leaves a total of 139.97 acres—87.02 acres of corn and 52.95 acres of alfalfa—available for dairy stock.

During the summer six months, or 182 days, the cows should produce an average of 13 pounds of milk per day, and would require the following ration:

Ration No. 4.

FEED	Pounds	Digestible nutrients			Nutritive ratio
		Protein	Carbo-hydrate	Fa	
Silage	40	.36	4.52	.28	
Alfalfa hay	13.5	1.49	5.34	.17	
Total nutrients		1.85	9.86	.45	1:5.9
Nutrients required for 1100-lb. cow					
Producing 13 pounds milk daily..		1.38	10.51	.32	.....

TABLE 11.—Feed and Acreage for One Cow for the Summer Six Months.

	Pounds fed per cow	Acres per cow
Corn silage	7280+5% waste = 7644	.32
Alfalfa	2457	.31
		.63

This shows that it takes .63 of an acre to supply the feed for one cow during the summer six months.

*It has been demonstrated at the University of Illinois that this is a practical ration to feed horses.

During the winter six months the cows should produce, on the average, 24 pounds of milk per day, and would require the following ration:

Ration No. 5.

FEED	Pounds	Digestible nutrients			Nutritive ratio
		Protein	Carbo-hydrate	Fat	
Silage	40	.36	4.52	.28	
Corn meal	5.5	.43	3.67	.24	
Alfalfa hay	11	1.21	4.36	.13	
Total nutrients		2.00	12.55	.65	1:7.0
Nutrients required for 1100-lb cow producing 24 lbs. milk daily.....		1.88	12.88	.49	.....

Fifty-seven acres of the corn ground is sown to rye as soon as the corn is cut, and the cows are on rye pasture two weeks in the fall and forty days in the spring. The ground will be too wet a portion of the time during the rainy weather to turn the cows to pasture, and only 33 days of rye pasture are counted during the year. While on rye the cows are given only one-third of a ration of silage and hay with no grain. Ration No. 4 would therefore be fed only five months, and a ration composed of 15 pounds of silage and 4 pounds of alfalfa hay is fed the remaining 33 days while on rye pasture.

TABLE 12.—Feed and Acreage for One Cow for the Winter Six Months.

	Pounds fed per cow	Acres per cow
Corn silage	6495+5% waste = 6820	.28
Corn meal	825	.27
Alfalfa	1770	.22
		.77

This shows that it takes .77 of an acre to support a cow during the winter six months, with the catch crop of rye used for pasture.

As it requires .55 of an acre of corn for the winter six months and .32 of an acre for the summer six months, it follows that .87 of an acre of corn would supply the corn ration for a cow for one year. Since it takes .22 of an acre of alfalfa for the winter six months and .31 of an acre for the summer six months, .53 of an acre of alfalfa would be sufficient to supply the alfalfa part of the ration for a cow for one year. The 87.02 acres of corn available for dairy stock would support 99.9 cows, and the 52.95 acres of alfalfa which are available for dairy stock would support 100.3 cows. It necessarily follows that by this system 100 cows could be kept on the 139.97 acres available for this purpose, which means 1.4 acres per cow per year. A herd of this size would require two bulls and the raising, on the average, of 14 heifers a year to replenish the herd. This system would then support 84 milch cows producing an average of 6000 pounds of milk per year, or a total of 504,000 pounds for the farm averaging 3150 pounds per acre.

CONCLUSIONS.

Comparing actual results obtained on practical dairy farms in the intensive dairy region of northern Illinois with each of these systems, we find the following results:

TABLE 13.—Percent of Land in Different Crops and Returns Per Acre.

CROP	System No. 1	Farm No. 1	System No. 2	Farm No. 2	System No. 3	Farm No. 3	System No. 4	Farm No. 4
Corn	25	25	37.5	23.5	37.5	35	62.5	56.5
Oats	25	21.5	12.5	10	12.5	14	....	....
Timothy	12.5	16	....	....	....	....	....	....
Clover .....	....	....	12.5	19.5	12.5	14	....	....
Clover and timothy ....	....	....	12.5	19.5	....	....	....	....
Pasture	37.5	37.5	25	27.5	25	37	....	....
Alfalfa .....	....	....	....	....	12.5	....	37.5	43.5
Lbs. milk per acre.....	991	994	1475	1341	2025	2145	3150	4185
Amount feed purchased		\$400		\$500		\$1100		

Farm No. 1 produces 994 pounds of milk per acre, or 3 pounds more than System No. 1, but at an outlay of \$400 for feed. Farm No. 2 falls short of System No. 2 by 134 pounds of milk per acre and an annual expenditure of \$500 for feed. Farm No. 3 spends \$1,100 annually on concentrated feeds, which System No. 3 supplies from the 12.5 per cent of its area devoted to alfalfa. The excess in pounds of milk in farms No. 3 and No. 4 over Systems No. 3 and No. 4 may be accounted for by the fact that but few calves are raised on farm No. 3 and none at all on farm No. 4. These farms compare so closely to the systems in percentage of acres devoted to the various crops and the returns received per acre, that they may well be taken as examples of the system in actual practice.

Many think that alfalfa cannot be grown successfully in Illinois, but it is being grown to advantage in nearly every county in the state and meeting with but few failures where intelligently sown on well-drained land, if the soil has been properly prepared. We have had from 10 to 45 acres of alfalfa growing on the dairy farm at the University for the past eight years and but one piece has winter killed during this time.

Wonders of increased production have been worked on many dairy farms by getting better cows; and it is here shown that amazing results may also be obtained by following a better system of cropping. It must be remembered that all results in this bulletin are comparative.

The value of the different commodities which the farmer receives from the farm without being charged to it, such as house rent, fruit, garden truck, chickens, eggs, milk, etc., are figured as balancing the general running expenses of the farm outside of the interest, labor, etc.

The most important portions of the following table are the *pounds of milk produced per acre, money value of this milk, and amount left for profit in each system*, all of which are printed in bold-face type to show the relative efficiency of the four systems.

Summary of the Four Systems.

System.	No. 1	No. 2.	No. 3.	No. 4.
Acres corn	38	57	57	95
Acres rye in corn			(19)	(57)
Acres oats	38	19	19	..
Acres timothy	19	19	19	..
Acres clover	..	19	19	..
Acres clover and timothy...	..	19	38	..
Acres pasture	57	38	19	57
Acres alfalfa	..	8	8	8
Acres roads and yards	8			
Total.....	160	160	160	160
Lbs. digestible protein available	26,804	35,024	48,850	80,237
Total digestible nutrients available	245,182	322,859	379,126	617,730
No. men required	3	4	4.5	6.5
No. horses required	4	5	5	6
Acres to support horses....	15.9	17.9	13.3	12
Acres required per cow.....	3.6	2.6	2.1	1.4
Herd in cow equivalent.....	38	51	65	100
Bulls kept	1	1	2	2
Average No. heifers raised..	5.3	7.1	9	14
No. old cows sold yearly....	5.3	7.1	9	14
No. calves sold yearly.....	23.2	31.5	39.6	61.6
Average No. cows kept.....	31.7	42.9	54	84
Average production per cow	5000	5500	6000	6000
Total pounds milk produced	158,500	235,950	324,000	504,000
Pounds milk per acre	991	1475	2025	3150
Value milk per acre at \$1.53 1-3 per 100 lbs.	\$ 15.20	\$ 22.62	\$ 31.05	\$ 48.30
Total value milk produced..	\$ 2,430.33	\$3,617.90	\$4,968.00	\$7,728.00
Value cows and calves sold..	202.10	272.00	343.80	534.80
Total value of products....	\$ 2,632.43	\$3,889.90	\$5,311.80	\$8,262.80
Cost of labor at \$450 per man per year	\$ 1,350.00	\$1,800.00	\$2,025.00	\$2,925.00
Interest on land at \$150 per acre at 5%*.....	1,200.00	1,225.00	1,250.00	1,310.00
Taxes	80.00	85.00	90.00	100.00
Labor, interest and taxes...\$	2,630.00	\$3,110.00	\$3,365.00	\$4,335.00
Amount left for profit.....	\$ 2.43	\$ 780.00	\$1,947.00	\$3,928.00
Cost per acre to replace by rock phosphate, phosphorus removed	3.8c	5c	6.5c	10c
Total pounds nitrogen produced by legumes .....	.....	2,610	5,420	10,830
Total pounds nitrogen removed in milk and lost in handling manure	1,900	2,500	3,140	5,000
Total pounds nitrogen gained or lost	-1,900	110	2,280	5,830

*The interest is computed on \$150 land for system No. 1, and to make allowance for building for the larger herds, from \$500 to \$2,200 are added to the investment for each of the other systems. The taxes are increased in proportion to the size of the buildings and herd.

Increased Protein and Digestible Nutrients Basis of Increased Production.

As has been noted, the digestible nutrients increase 77,177, 56,767 and 238,604 pounds respectively, from system to system, while the increase in protein is even greater, as System No. 4 produces 80,237 pounds digestible protein, or over three times that of System No. 1.

Total Digestible Nutrients.

System No. 1.....	245,182 Lbs.
System No. 2	322,359 Lbs.
System No. 3.....	379,126 Lbs.
System No. 4.....	617,730 Lbs.

Protein.

System No. 1.....	26,804 Lbs.
System No. 2.....	35,024 Lbs.
System No. 3.....	48,850 Lbs.
System No. 4.....	80,237 Lbs.

Increased Production Basis of Increased Returns.

It will be noted that under System No. 1, 991 pounds of milk are produced per acre. By simple changing the crops raised, but feeding to cows of the same quality, the amount of milk produced in System No. 1 is increased over three times in System No. 4, and the receipts from milk alone are increased from \$15.20 per acre in System No. 1 to \$48.30 per acre in System No. 4.

System No. 3 produces more than twice as much milk per acre as System No. 1, and is, perhaps, the system best adapted to the general conditions in the dairy districts of the state to-day.

System No. 4 is the most likely to meet the requirements of the dairyman with a small amount of productive land who wishes to practice intensive methods. Where the land is high-priced and sufficient help can be obtained, this system will prove the most remunerative if intelligently pursued. On a quarter section of land 84 cows can be kept just as well as 32 cows and yet have all their feed produced on the farm. It simply depends on whether System No. 1 or No. 4 is used to produce the feed.

Increased returns Basis of Increased Profits.

The small profit shown for System No. 1 means that after all labor is paid for at market prices and the incidental expenses figured as offset by the income from garden, orchard, etc., there is left for profit but \$2.43. This means that the dairyman is just able to make a living by this system and the extras of life must come from the labor returns of the women and children, who receive no remuneration whatever. There are dairy farms in Illinois conducted in this manner that do not pay 5 per cent interest on the investment. And this is not all; the farm is continually running down in producing power so that smaller and smaller yields are obtained year after year, making this deplorable condition grow gradually worse. System No. 2 has \$780 profit, System No. 3 \$1,947, and System No. 4 \$3,928 profit above interest on the investment and pay for labor, including the proprietor's labor at common wages. If, as is likely to be done on more intelligently conducted farms, better methods of breeding were instituted under Systems Nos. 3 and 4, so as to increase the efficiency of the cows, there would be a much larger difference in the total returns than here indicated.

Increased Profits Not In Money Value Alone.

It should also be noted that while System No. 1 reduces the nitrogen in the soil 1900 pounds per year and exhausts the humus, the other three systems increase the nitrogen 110, 2280 and 5830 pounds respectively, per year, besides increasing the humus. As nitrogen and humus, because of their scarcity, are

already the limiting factors in most soils, System No. 1 is a ruinous practice to pursue, while with Systems No. 3 and No. 4 the dairymen are not only making money, but the farm is gradually becoming more productive year after year, so that as time goes on their profits continually increase, provided only that attention be given to depleted mineral constituents. With System No. 4 there is an annual increase of 38 pounds of nitrogen per acre, while with the poorest system there is a loss of $12\frac{1}{2}$ pounds per acre annually. Yet poor as System No. 1 is, it does not compare in depleting the soil with the practice of selling a 55-bushel crop of corn from the land and then burning the stalks, as is so frequently practiced through the corn belt in this day of progressive agriculture. Few yet realize the full meaning of such practices to the future agriculture of our state.

Growing large quantities of legumes, as is done in Systems No. 3 and No. 4, not only increases the nitrogen, but if all manure is carefully preserved and applied to the soil, the humus will also be increased, and by paying special attention to good tillage the physical condition of the soil will without doubt be greatly improved, making the farm more productive year after year. Without the soil in good physical condition, no farm can do its best. There is scarcely a farm in Illinois on which the productive power cannot be greatly increased by the growing of more legumes, the intelligent use of manure and good tilling. Ten cents per acre will replace the necessary mineral constituents removed in the milk by System No. 4, and if twice this amount were applied each year the dairymen would be enriching his soil.

The marvelous difference in the profits derived from these four systems of cropping are best shown by a direct comparison of the profits left by each system. System No. 1 returns \$2.43; System No. 2 returns \$780, or 321 times the profit of No. 1; System No. 3, \$1,947, or 801 times that of No. 1; and System No. 4, \$3,928, or 1616 times the profit of System No. 1, besides adding 5830 pounds of nitrogen to the soil of the farm. These

figures show that an intensive system of dairy farming will rapidly increase the profits and the producing power of the farm, even though all the milk is sold, if the system includes the liberal growing of legumes, the careful saving and applying of all manure, and the addition of a few cents' worth of mineral constituents per acre annually, thus making *not only a permanent agriculture, but an accumulative agriculture which at the same time is highly remunerative.*



Annual Reports.

TREASURER'S REPORT FOR YEAR ENDING JULY 1, 1911.

RECEIPTS.

July 1, 1910.	Balance on hand	\$ 991.59
Aug. 13, 1910.	From Geo. Caven for state appropriation	2,500.00
Oct. 29, 1910.	From Geo. Caven	8.00
Jan. 28, 1911.	From Geo. Caven	253.56
Feb. 4, 1911.	From Geo. Caven	76.00
Feb. 11, 1911.	From Geo. Caven	30.00
Feb. 20, 1911.	From Geo. Caven	241.13

\$4,100.28

DISBURSEMENTS.

1910.		Voucher No.	
July 16.	Geo. Caven, to balance account year July 1, 1909, to July 1, 1910	149	\$ 25.64
July 6.	Chas. E. Cox, premium at Vandalia (was over- looked when making up list)	150	6.00
Aug. 23.	S. B. Shilling, expenses as speaker Camp Point, Aug. 20, 1910	151	24.24
Aug. 23.	Chicago Engraving Co., cuts for 1910 report...	152	11.32
Sept. 19.	Chas. Gilkerson, expense connection State Fair Dairy exhibit	153	46.25
Sept. 19.	Elgin Dairy Report, printing certificates....	154	2.75
Sept. 19.	Chicago Engraving Co., cuts for report	155	6.72
Oct. 13.	Geraghty & Co., 500 badges	156	8.00
Oct. 13.	Jos. Newman, expense Directors' meeting, Springfield	157	16.55
Oct. 13.	Chas. Foss, expense Directors' meeting, Spring- field	158	9.40
Oct. 13.	A. F. Jansen, expense Directors' meeting, field	159	7.98
Oct. 13.	Tripp & Co., ten card signs	160	15.00
Oct. 13.	Chicago Produce Co., 2 M letter heads, \$4.60, 350 Neostyle letters, \$2.50, 2 half tones, \$6.26	161	13.36
Oct. 13.	Geo. Caven, Committee meeting, Elgin, \$3.45; Directors', Springfield, \$16.25; postage, \$3.50; letters to buttermakers, \$3.50.....	162	23.70
Oct. 13.	L. N. Wiggins, expense called meeting at El- gin	163	20.35

Nov. 4.	W. W. Marsh, premiums State Fair, dairy cattle	164	40.00
Nov. 4.	Ryanogue Farm, premiums State Fair, dairy cattle	165	5.00
Nov. 4.	Hartman Stock Farm, premiums State Fair, dairy cattle	166	5.00
Nov. 4.	F. R. Sanders, premiums State Fair, dairy cattle	167	10.00
Nov. 4.	Allynhurst Farm, premiums State Fair, dairy cattle	168	5.00
Nov. 4.	M. R. Evans, premiums State Fair, dairy cattle	169	5.00
Nov. 4.	W. T. Gratton, premiums State Fair, dairy cattle	170	5.00
Nov. 4.	E. M. Barton, premiums State Fair, dairy cattle	172	5.00
Nov. 4.	Geo. Caven, 1st half salary 1910-1911, \$150.00; expense dairy show, \$7.35	173	157.35
Nov. 4.	Chicago Produce Co., booth space assessment headquarters' dairy show	174	8.00
Nov. 7.	Geraghty & Co., Ill. badges at dairy show	175	11.50
Nov. 11.	Lowrie & Black, publishing 3 M annual reports	176	830.56
Nov. 7.	Elgin Dairy Report, 3 M letter heads	177	3.00
Nov. 7.	Bessie Gilkerson, attending booth and R. R. fare State Fair	178	40.84
Nov. 7.	Chas. Gilkerson, expenses State Fair	179	12.20
Nov. 7.	L. N. Wiggins, State Fair and Chicago	180	51.90
Nov. 8.	Mrs. Grace Durand, 1st certified milk, 1st certified cream	181	10.00
Nov. 8.	G. B. Drake, 1st market milk	182	5.00
Nov. 8.	E. N. Gillham, 1st market cream	183	5.00
Nov. 9.	Forest Glen Creamery Co., pro rata premium State Fair	184	6.00
Nov. 9.	John Grosser, pro rata premium State Fair....	185	4.80
Nov. 9.	G. P. Sauer, pro rata premium State Fair	186	4.25
Nov. 9.	L. R. Weckerly, pro rata premium State Fair ..	187	4.50
Nov. 9.	K. B. Carpenter, pro rata premium State Fair ..	188	4.00
Nov. 9.	Pioneer Creamery Co. pro rata premium State Fair	189	4.00
Nov. 9.	H. Jacobson, pro rata premium State Fair	190	4.00
Nov. 9.	Percy Veigiss, pro rata premium State Fair ...	191	3.75
Nov. 9.	Robt. Moren, pro rata premium State Fair	192	3.15
Nov. 9.	Wm. J. Kane, pro rata premium State Fair	193	3.15
Nov. 9.	R. A. Wilson, pro rata premium State Fair	194	2.30
Nov. 9.	Geo. Bloyer, pro rata premium State Fair	195	2.60
Nov. 9.	Roscoe Barber, pro rata premium State Fair...	196	2.85

Nov. 9.	E. N. Gillham, pro rata premium State Fair	197	6.50
Nov. 9.	Mrs. E. H. Springer, pro rata premium State Fair	198	5.60
Nov. 9.	Jos. Meyers, pro rata premium State Fair	199	4.60
Nov. 9.	Mary E. Thler, pro rata premium State Fair ..	200	4.20
Nov. 9.	W. F. Willard, pro rata premium State Fair ..	201	3.20
Nov. 9.	Jno. Floteman, pro rata premium State Fair ..	202	3.70
Nov. 9.	Mrs. E. R. Clark, pro rata premium State Fair.	203	3.30
Nov. 9.	Robt. Rathsack, pro rata premium State Fair ..	204	3.30
Nov. 9.	M. A. Terpening, pro rata premium State Fair..	205	2.80
Nov. 9.	Chas. Foss, pro rata premium State Fair	206	2.80
Nov. 9.	J. C. Bruner, pro rata premium State Fair	207	2.80
Nov. 9.	Hallock Shearer, pro rata premium State Fair..	208	2.80
Nov. 9.	L. F. Gimmy, pro rata premium State Fair	209	2.80
Dec. 3.	L. N. Wiggins, expense Chicago meeting in connection with Elgin convention	210	30.00
Dec. 3.	Geo. Caven, Sec., mailing annual reports	211	60.00
Dec. 29.	Chas. Gilkerson, October meeting Directors, - Chicago	212	4.60
Dec. 29.	A. F. Jansen, October meeting Directors, Chicago	213	12.96
Dec. 29.	S. B. Shelling, Auxiliary Convention, Watseka and Clinton, Dec. 21-23, 1910	214	26.60
1911.			
Jan. 20.	Geo. Caven, second half salary as Secretary, 1910-11	215	150.00
Jan. 20.	Mrs. Marguerite A. Schultz, typewriting resolutions	216	3.55
Jan. 20.	Theo. F. Swan, printing and labor Elgin Convention	217	6.70
Jan. 20.	John Newman Co., expenses Elgin Convention as per bill	218	15.30
Jan. 20.	W. S. Bayles, use of and moving piano	219	5.00
Jan. 20.	C. E. Aldrich, use of Coliseum, annex and lights	220	169.40
Jan. 20.	Jos. Newman, five dairy cows used in tuberculosis demonstration at Elgin Convention	221	300.00
Jan. 28.	B. W. Newman, balance expense Elgin exhibits	222	26.00
Jan. 28.	Eugene Davenport, expense Elgin Convention..	223	9.79
Jan. 28.	W. J. Fraser, expense Elgin Convention	224	9.60
Jan. 28.	W. C. Willson, expense speakers and guests Elgin Convention	225	78.90
Jan. 28.	Elk Drug Store, disinfectant used in Coliseum, Elgin	226	3.00
Jan. 28.	Elgin Storage & Transfer Co., cartage Elgin Convention	227	13.00

Jan. 28.	G. A. Barnes, shavings used to protect Coliseum floor	228	21.84
Jan. 28.	Geister Brothers, 5 rolls blizzard, \$16.25; hay to feed cows, Coliseum, \$22.38	229	38.63
Jan. 28.	D. F. Barclay, nails, scoop, etc.	230	6.02
Jan. 28.	Elgin Lumber Co., lumber used fitting up Coliseum, Elgin	231	73.31
Jan. 28.	F. A. Jorgensen, attending Elgin Convention, fixing up display and test room	232	37.29
Jan. 28.	W. W. Marple, expense Elgin Convention and Auxiliary meeting at Clinton and Watseka	233	54.50
Jan. 28.	Elgin Dairy Report, printing 600 programs, 1,000 posters, 300 entry blanks, 150 score cards, 1,000 envelopes and 23 badges	234	75.10
Jan. 28.	Theo. F. Swan, 1,000 envelopes and stamps....	235	11.25
Jan. 28.	The Martin Signs, sign used Elgin Convention..	236	1.50
Jan. 28.	Chicago Produce Co., printing	237	10.15
Jan. 28.	Chas. Foss, Chicago meeting expense, \$8.46, Elgin Convention, \$6.48	238	14.94
Jan. 28.	G. W. Ingersoll, 500 circulars	239	2.75
Jan. 28.	Fred W. Jencks, posting bills in Elgin and 25 other towns	240	30.00
Jan. 28.	Lowrie & Black, shipping reports	241	9.52
Jan. 28.	Greenduck Co., 350 badges Elgin Convention...	242	70.00
Jan. 28.	S. B. Shilling, expenses Elgin Monday and Tuesday	243	13.00
Jan. 28.	Dr. John Scott, conducting tuberculosis post mortem, Elgin	244	30.75
Jan. 28.	Ferson & Plant, hauling cows Elgin Convention	245	6.00
Jan. 28.	H. L. Russell, conducting tuberculosis test Elgin Convention	246	50.00
Jan. 28.	Dr. W. R. Welch, securing cows for tuberculosis test, superintending cattle exhibit at Elgin Convention	247	50.00
Jan. 28.	L. N. Wiggins, Elgin, 12-19-10; Elgin 1-19-11, office expense, etc.	248	65.00
Jan. 28.	Alice Donahue, stenographic work	249	25.00
Feb. 2.	Aurora, Elgin & Chicago Ry. Co., electric services Elgin Convention	250	31.28
Feb. 2.	E. Sudendorf, expense program committee and Elgin Convention	251	15.35
Feb. 2.	C. J. Rohrer, bacteriological examination milk exhibit	252	24.34
Feb. 2.	N. W. Hepburn, milk and butter contests Elgin	253.	11.38
Feb. 2.	John Lynch, expenses Watseka and Elgin meetings	254	57.02

Feb. 2.	Elgin Dairy Report, 2,000 four-page folders....	255	12.00
Feb. 2.	A. F. Jansen, expense Elgin Convention	256	15.40
Feb. 2.	Hugh G. Van Pelt, expense Elgin Convention ..	257	37.22
Feb. 2.	John Payne, carriage hire for speaker, Elgin..	258	1.75
Feb. 2.	C. D. Ettinger, pro rata premium, \$5.00; butter, \$1.25	259	6.25
Feb. 5.	L. E. Macky, pro rata	260	2.50
Feb. 5.	E. J. Mattson, pro rata, \$2.50; butter, \$1.25	261	3.75
Feb. 5.	J. Ducharme, pro rata	263	6.25
Feb. 5.	F. G. Irons, pro rata	264	5.25
Feb. 5.	L. Phillips, pro rata	265	1.62
Feb. 4.	C. E. Mortenson, pro rata	267	2.75
Feb. 5.	E. T. Moore, pro rata \$4.62, 1st butter judging \$15.00, 5th milk test \$3.00	268	22.62
Feb. 5.	W. L. Curliss, pro rata	269	2.12
Feb. 5.	Farina Creamery Co., pro rata	270	4.12
Feb. 5.	M. E. Simonson, pro rata	271	2.12
Feb. 5.	H. O. Henry, pro rata	272	1.87
Feb. 5.	Peterson Bros., pro rata	273	1.25
Feb. 5.	M. Jansen, pro rata	274	5.87
Feb. 5.	Wm. Bramstedt, pro rata	275	6.25
Feb. 5.	O. W. Hicks, pro rata	276	5.62
Feb. 5.	George W. Hoppensteadt, pro rata	277	4.12
Feb. 5.	P. J. Peterson, pro rata	278	6.00
Feb. 5.	K. B. Carpenter, pro rata	279	4.37
Feb. 5.	F. Grimm, pro rata	280	3.75
Feb. 5.	Wm. Englebrecht, pro rata	281	3.12
Feb. 5.	Geo. A. Cutler, pro rata	282	5.37
Feb. 5.	Huntley Dairy Co., pro rata	283	3.50
Feb. 5.	Roscoe Barber, pro rata	284	6.50
Feb. 5.	C. M. Dooley, pro rata	285	4.00
Feb. 5.	L. R. Weckerly, pro rata, \$4.62, 1st testing \$15.00	286	19.62
Feb. 5.	H. L. Moore, pro rata	287	4.75
Feb. 5.	W. L. Richards, pro rata	288	2.50
Feb. 5.	F. J. Weddige, pro rata \$6.62, 5th butter judg- ing \$4.00	289	10.62
Feb. 5.	P. W. Virgin, pro rata	290	6.50
Feb. 5.	R. Moren, pro rata \$5.25, 5th butter judging \$3.00	291	8.25
Feb. 5.	W. Annis, Butter Sweepstakes \$15.00, 2nd milk testing \$12.00	292	27.00
Feb. 5.	George Bloyer, pro rata \$6.62, 2nd butter judging \$12.00, 3rd milk testing \$10.00	293	28.62
Feb. 5.	F. Grimm, pro rata	294	6.50
Feb. 5.	E. J. Deardorff, pro rata	295	2.25
Feb. 5.	M. L. Musselman, pro rata	296	3.75
Feb. 5.	A. J. Negus, pro rata	297	3.75

Feb. 5.	R. H. Means, pro rata	298	6.50
Feb. 5.	A. A. Adams, pro rata	299	5.62
Feb. 5.	Louis Neilsen, pro rata \$2.25, 4th milk testing \$6.00	300	8.25
Feb. 6.	L. H. Knigge, pro rata	301	5.00
Feb. 6.	H. M. Ross, pro rata	302	6.25
Feb. 6.	C. W. Swateck, pro rata	303	6.62
Feb. 6.	C. Long, pro rata	304	5.25
Feb. 6.	A. J. Spohn, pro rata	305	3.12
Feb. 6.	L. Johnson, pro rata	306	2.75
Feb. 6.	H. Horneman, 4th butter judging	307	6.00
Feb. 6.	C. Stocker, 5th milk testing	308	4.00
Feb. 6.	C. D. Bartlett, butter	309	1.25
Feb. 6.	R. H. Pennington, butter	310	1.25
Feb. 6.	J. R. Biddulph, 1st, 2nd, 3rd American cheese, 1st sage, 1st brick \$5.00, 1st limburg \$5.00..	312	30.00
Feb. 6.	Natoma Farm, 3 firsts milk contest \$15.00, one- half of 3rd \$1.00	313	16.00
Feb. 6.	J. F. Sanmann, 1st market brick	314	5.00
Feb. 6.	C. D. Bartlett, 2nd market cream \$3.00, one-half 3rd \$1.00	315	4.00
Feb. 6.	P. Hoy, \$3.00, 2nd prizes \$9.00, 3rd milk contest \$2.00	316	11.00
Feb. 6.	E. J. Mattson, 3rd certified milk \$2.00, 3rd certi- fied cream \$2.00	317	4.00
Feb. 6.	Chas Foss, Dairy Sweepstakes \$10.00, 3rd butter judging \$10.00	318	20.00
Feb. 6.	Arthur Maule, pro rata	319	5.62
Feb. 21.	Chas. Gilkerson, expense Elgin Convention....	320	11.95
Feb. 21.	J. P. Mason, expense attending meetings 1910- 11	321	49.55
Feb. 21.	A. B. Potts, stenographic report, annual report Elgin	322	75.00
April 7.	Dairy Department, University of Illinois, ex- pense butter exhibit Elgin Convention ..	323	17.60
April 7.	S. B. Shilling, expense Aux. meeting Augusta, Ill.	324	24.00
April 7.	Geo. W. Ingersall, envelopes	325	2.25
April 7.	P. R. Barnes, expense Aux. meeting Effingham	326	21.82
April 13.	Courier Pub. Co., 100 window cards, Elgin Convention	327	2.50
April 13.	Joseph Newman, expense attending Ottawa meeting of Directors	328	9.50
April 13.	Chas. Foss, expense attending Ottawa meeting of Directors	329	7.80
April 13.	Chas. Gilkerson, expense Ottawa meeting of Directors	330	10.09

April 13.	E. Sudendorf, expense Ottawa meeting of Directors	331	4.95
June 21.	State Board of Live Stock Commission, premium at Springfield meeting	332	20.00
June 21.	Wm. G. Morstrom & Co., Gold Medal given in butter contest at Elgin Convention	334	13.50
Total			<u>\$4,050.09</u>
Total cash received for year to July 1, 1911			\$4,100.28
Total disbursements for year to July 1, 1911			<u>\$4,050.09</u>
Balance on hand July 1, 1911			\$ 50.19

Respectfully submitted,

CHARLES FOSS, Treasurer.

Approved:

CHARLES T. GILKERSON,

E. SUDENDORF.

P. S.—Missing Order 171, for \$5.00, issued to J. E. Hatfield, Normal, Ill., not presented. Missing Orders 262, 266, 311 and 333 are void.



SECRETARY'S REPORT.

Directors Illinois State Dairymen's Association:

Gentlemen:—Herewith I submit my report of money received and paid out during the year, July 1, 1910-July 1, 1911:

Receipts.

President Wiggins (State Appropriation)	\$2,500.00
Memberships	198.00
Treasurer Foss	391.05
Joseph Newman (for Elgin)	310.00
Kerber Packing Co.	76.13
Advance Fence Co.	3.00
Sharples Separator Co.	10.00
Worcester Salt Co.	10.00
Jensen Manufacturing Co.	10.00
J. G. Cherry Co.	10.00
Hansen's Laboratory	5.00
Creamery Package Manufacturing Co.	25.00
Elgin Butter Tub Co.	10.00
J. B. Ford Co.	20.00
Vermont Farm Machine Co.	15.00
A. H. Barber Creamery Supply Co.	10.00
DeLavel Separator Co.	30.00
Wells & Richardson Co.	15.00
Total	\$3,648.18

Paid Out.

To Treasurer Foss	\$2,500.00
To Treasurer Foss	608.69
Telegrams	2.02
To Dairy Show expenses	8.35
To envelopes for report	3.23
To photo for report	1.50
To Exchange	.20
To labor	7.10
To Chicago Produce Co.	2.00
To mailing reports	42.50
To mailing letters, programs, etc.	46.10
To freight and express	19.90
To location, committee expense	13.45
To Hotels, Elgin, January Convention	36.71
To Secretary, traveling expenses	48.54
To Secretary, salary	300.00
To twice paid Memberships (returned)	3.00

Total	\$3,643.29
To check to Treasurer	4.89
Total	\$3,648.18

Approved:

CHARLES T. GILKERSON,

E. SUDENDORF.

The past year was a busy one for the Association. Our annual Convention at Elgin in January was the largest meeting of dairymen in the history of the state and the largest Convention both in the display of dairy machinery and supplies, and in the scope of the program presented in the history of the Association. It was the first Convention at which dairy cattle were shown, and this proved to be a most valuable and attractive feature.

Because of the tuberculosis demonstration, details of which are given elsewhere in this report, this Convention aroused state wide interest. We feel that the knowledge gained justified the expense.

Besides the annual Convention, one day conventions were held at Camp Point, Watseka, Clinton, Augusta, Effingham and Damascus, and speakers were sent to two other meetings arranged by the Dairy Department, Illinois College of Agriculture. One day meetings were arranged also for St. Joseph and Goode-now, but local conditions on the dates agreed caused postponement.

DIRECTORS' MEETINGS.

The first and principal meeting of directors of the Association was held at Ottawa in February, during the round-up of State Farmers' Institutes. At that meeting Vice President Mason presided. Charles Foss of Centerville was elected Treasurer for the ensuing year and George Caven, Chicago, was elected Secretary.

On motion Messrs. Foss and Caven were instructed to arrange a day's meeting at Damascus, and the President and Secretary were instructed to arrange other meetings in the state where the outlook promised well for a good attendance of dairy-men.

Notice was given by the Secretary of the resignation of A. F. Jansen of Effingham as a Director. The Secretary was instructed to ask Mr. Jansen to place his resignation in writing, and F. G. Austin of Effingham was elected to occupy Mr. Jansen's place on the Board.

A bill of J. F. Sanmann, Havana, incurred when looking up a location for a one-day dairy meeting, was ordered paid when presented.

On motion E. Sudendorf of Clinton and Chas. Gilkerson of Marengo were appointed to audit and approve the annual reports of the Treasurer and Secretary.

A second meeting of Directors held in Springfield during the State Fair received requests from Elgin and Camp Point as places for the next Convention. Directors felt, on account of a promise given the previous year, that Elgin was entitled to the meeting and decided to go there if citizens would appropriate \$300 toward the expense of the Convention. Directors were requested to arrange for dairy meeting, each in his section of the state.

The third meeting of Directors was held in Chicago at the National Dairy Show and the decision reached locating the next Convention in Elgin. Mr. Joseph Newman guaranteed that the terms required of Elgin for the Convention would be met. Mr. Newman, E. Sudendorf and the Secretary were appointed a committee on program with power to act.

GEORGE CAVEN,

Secretary.

State Fair Winners.

Following shows the disposition of the prizes offered by the Association at the 1910 State Fair:

THREE DAY BUTTER FAT TEST.

COWS 3 YEARS OLD OR OVER.

First to W. W. Marsh, Waterloo, Iowa. Glencoe's Bo-peep, 18602.

Second to Ryanogue Farm, Brewster, N. Y. Bell Douglas, 27565.

Third to Hartman Stock Farm, Columbus, Ohio. Pride of Hilldale, 179929.

HEIFERS UNDER 3 YEARS OLD.

First to W. W. Marsh. Ladysmith of the Isle, 28355.

Second to F. R. Sanders, Bristol, N. H. Saline Maid, 1555.

Third to Allynhurst Farm, Delavan, Wis. Betty of Allynhurst, 4155.

HOLSTEIN-FRIESIAN COW, 3 OR OVER, BEST IN TEST.

Premium to M. R. Evans, Hinckley, Ill., Lady Mercedes Pauline DeKol Gem, 87284.

HOLSTEIN-FRIESIAN HEIFER UNDER 3, BEST IN TEST.

Premium to W. T. Gatton, Springfield, Ill. Princess Hoosier Lass, 110962.

JERSEY COW, 3 YEARS OR OVER, BEST IN TEST.

Premium to Hartman Stock Farm. Pride of Hillside, 179929.

JERSEY HEIFER UNDER 3, BEST IN TEST.

Premium to J. E. Hatfield, Normal, Ill. Handsome Maid, 222729.

AYRSHIRE COW, 3 OR OVER, BEST IN TEST.

Premium to Ryanogue Farm. Bell Douglass, 27565.

AYRSHIRE HEIFER UNDER 3, BEST IN TEST.

No entry.

BROWN SWISS COW, 3 OR OVER, BEST IN TEST.

Premium to E. M. Barton, Hinsdale, Ill. Iown Lass, 3316.

BROWN SWISS HEIFER UNDER 3, BEST IN TEST.

Premium to Allynhurst Farm. Betty Allynhurst 4155.

GUERNSEY COW, 3 OR OVER, BEST IN TEST.

Premium to W. W. Marsh. Glencoe's Bopeep, 18602.

GUERNSEY HEIFER UNDER 3, BEST IN TEST.

Premium to W. W. Marsh. Ladysmith of the Isle, 28355.

DUTCH BELTED COW 3 OR OVER, BEST IN TEST.

Premium to F. R. Sanders. Sweet Marie, 1355.

DUTCH BELTED HEIFER UNDER 3, BEST IN TEST.

Premium to F. R. Sanders. Saline Maid, 1555.

MILK AND CREAM TEST.**CERTIFIED MILK.**

Mrs. Grace Durand, Lake Forest, Illinois.

CERTIFIED CREAM.

Mrs. Durand.

MARKET MILK.

G. B. Dake, Harvard, Ill.

MARKET CREAM.

E. N. Gillham, Winchester, Ill.

DAIRY BUTTER.

	Score
E. N. Gillham, Winchester, Ill.	94 1-3
Mrs. E. H. Springer, Springfield, Ill.	94
Joseph Meyers, Freeport, Ill.	93 2-3
Mary E. Tebler, Farmingdale, Ill.	93 1-2
W. T. Willard, Chapin, Ill.	93 1-3
Jno. Floetum, Camp Point, Ill.	93 1-3
Mrs. E. R. Clark, Mokena, Ill.	93 1-6
Robert Rathsack, Greenview, Ill.	93 1-6
M. A. Turpening, Geneseo, Ill.	93
Charles Foss, Cedarville, Ill.	93
J. C. Bruner, Atlanta, Ill.	93
Hallock Shearer, Mt. Carmel, Ill.	93
L. F. Gisumy, Carrollton, Ill.	93

CREAMERY BUTTER.

Forest Glen Creamery Co., Round Lake, Ill.	95 1-2
John Grosser, Clinton Falls, Minn.	94 5-6
G. P. Sauer, E. Troy, Wis.	94 1-2
L. R. Wickerly, Dakota, Ill.	94 1-2
K. B. Carpenter, Mt. Carroll, Ill.	94 1-3
Pioneer Creamery Co., Camp Point, Ill.	94 1-3
Herluf Jacobson, Ridge Farm, Ill.	94 1-3
Percy Virgess, Belvidere, Ill.	94 1-6
Robert Moren, Freeport, Ill.	93 5-6
Wm. J. Kane, Thomson, Ill.	93 5-6
R. A. Wilson, Harvard, Ill.	93 1-3
George Bloyer, Harper, Ill.	93 1-2
Roscoe Barber, Foreston, Ill.	92 2-3

MEMBERSHIP LIST 1911-1912.

A

ALEXANDER, C. B., (Star Union Lines) Chicago.
ANTHONY, GRANT, Marengo.
ANDREWS, P. W., Marengo.
ARNOLD, A. H., (F. K. Highbee & Co.) Chicago.
AUSTIN, F. G., Effingham.

ADAMS, A. A., Harvard, R. D. 1.
AEBISCHER, JOHN, St. Jacobs.
ARCHIBALD, ARNOLD, Calhoun.
ALER, GEO., Rockfeller.
A. H. BARBER, Creamery Supply Co., Chicago.
AUTEN, A. O., Evanston.

B

BUSCHE, CHAS., 616 Park St., Elgin.
BEVERLY, C. E., Elgin.
BERNER, JOE, Elgin.
BRAND, R. E., Urbana.
BEAN, R. M., Marengo.
BASUIER, JOS., Marengo.
BIDDULPH, J. R., Tiskilwa.
BURRELL, G. E., 274 Billings St., Elgin.
BLAKE, CHAS., Belvidere.
BLAKE, FERDIE, Belvidere.
BARTLETT, C. D., Wheaton (DuPage County Farm).
BUCKNER, LOUIS A., Middletown.

BARBER, ROSCOE, Harper.
BROCHERS, H. C., 6319 Ellis Ave., Chicago.
BRISTOL, GEO. S., Plainfield.
BENTON, D. C., Kaneville.
BEREISTER, MRS. WM. C., Zion City.
BRAMSTEDT, WM., Mascoutah.
BALDWIN, GEO. H., Mendon.
BALDWIN, R. C., Redpath.
BLOYER, OTTO, Elkhorn Grove.
BRISTOL, G. S., Plainfield, R. R. 6.
BUCHANAN, G. L., Robinson, R. F.
BUELER, ANTON, Bemes.
BLOYER, GEO., Harper.
BOIS, W. A., Marengo.

BRAWN, ANTON, Vandalia, R. 3.

C

- CONN, JR., G. W., Woodstock.
 CAMPBELL, REA, Genoa.
 COUNCIL, G. G., Vandalia.
 COLTON, C. W., Marengo.
 CHASE, H. A., Harvard.
 CRISSEY, SHERMAN, Marengo.
 CAMPBELL, M. S., Genoa.
 CONNETT, H. G., Chillicothe.
 CASEY, WM., Elgin (Worcester Salt Co.)
 CROSIOR, ELI I., Utica.
 CREAMERY PACKAGE MFG. CO., Chicago.
 CARBAUGH, WM. T., Lanark, R. 1.
 CUTLER, GEO. A., Belvidere, R. 5.
- CARPENTER, K. B., Mt. Carroll.
 CLEGG, J. F., Chicago (Merrill & Eldredge).
 CAMPBELL, B. M., Mascoutah.
 COLEMAN, L. E., Belvidere.
 CARPENTER, K. B., Mt. Carroll.
 CAUDLE, J. C., Vernon.
 CAUSEY, J. S., Vandalia, R. 5.
 CAVEN, GEO., 136 W. Lake St., Chicago.
 COLLIER, R. J., Nokomis.
 CREDICOTT, H. J., Chicago.
 CROUCH, H. E., Urbana.
 CUNNINGHAM, C. A., Vandalia.
 CURTISS, MARK, Marengo.

D

- DAVIS, S. E., Elgin.
 DORMAN, J. E., Elgin.
 DE LANCY, JOHN, Elgin.
 DILLON, WM. C., Round Lake.
 DAHLIN, DR. C. T., Elgin.
 DORSEY, JAMES, Gilberts.
 DE BAER, SAM'L, Effingham.
 DALLMAN, G. A., 137 8th St., Fond du Lac, Wis.
 DURAND, MRS. GRACE, Lake Forest.
 DICKINSON, W. A., Dundee.
 DU CHARME, J. E., Davis, R. 1.
 DUMMER, C., Olney.
- DUELL, H. R., Savanna.
 DE LAVAL SEPARATOR CO., Chicago.
 DIAMOND CRYSTAL SALT CO., St. Clair, Mich.
 DAVENPORT, PROF. E., Urbana.
 DEWEY, F. E., Capron.
 DICKINSON, F. J., Woodbine.
 DOWLING, ROBT. J., Ontarioville.
 DAHLER, FRITZ, Pana.
 DAWDY, WM. H., Greenville.
 DELOS, JAS., Urbana.
 DUENSING, CHAS. G., St. Peter.

E

- EVANS, HARRY, Rockford.
 ENGFRING, W. H., Effingham.
 ENGLEBRECHT, WM., Mt. Carroll.
 EDMONSON, DR., Clinton.
 EHLERS, JNO., Altamont.
- ELGIN BUTTER TUB Co., Elgin.
 EASTERDAY, C. F., Vandalia.
 EHART, GOTTFREID, Shobonier.
 EHART, J., Shobonier.

F

FREDERICKS, ANDREW, DeLav-
al Separator Co.) Elgin.

FRASER PROF. W. J., Urbana.

FELLOWS, E. J., St. Charles.

FORSMAN, J. A., Lynn Center,
care Orphans' Home.

FOSS, CHAS., Cedarville.

FELLHOELTER, JOS. F., Effing-
ham.

FOX, O. V., Elgin.

FISHER, GEO. A., Addison.

FLICKINGER, E. H., Elizabeth.

FOSTER, THOS., Springfield (Le-
land Hotel Farm).

J. B. FORD CO., Wyandotte, Mich.

FIELDS, CHAS., Olney.

FRANCIS, F., New Lenox.

FREIN, H. P., Smithton.

FREUND, S. H., Johnsburg.

G

GOULD, WEBB N., Aurora.

GARLIEB, CHAS., Huntley.

GLOS, G. W., Elgin.

GREENE, H. C., Waterman.

GETZELMAN, T. E., Hampshire.

GILL, T. H., Marengo.

GILKERSON, CHAS., Marengo.

GRAY, O. W., Bartlett.

GOELLER, J. G., Tower Hill.

GREEN, G. M., Mt. Olive.

GROSSMAN, J. H., Martinville.

GREENWOOD, IVAN J., Bristol.

GURLER, G. H., DeKalb.

GIBBON, T. H., Elgin.

GRIMM, FERDINAND, Savanna,
R. 2.

H

HOARD'S DAIRYMAN, Ft. Atkin-
son, Wis.

HAYES, H. J., 1013 Corn Exchange
Bldg., Chicago.

HORNEMAN, H. C., Watseka.

HARVEY, E. G., LaFox.

HANLEY, M. J., Freeport.

HAVILAND, F. P., St. Charles.

HEWLETT, F. M., 5925 Kinmore
Ave., Chicago.

HERRICK, J. E. K., Springfield.

HALL, C. D., Ringwood.

HUNT, GEO. A., Woodstock.

HOLMES, A. J., Union.

HEPBURN, N. W., Urbana.

HEALEY, J. W., 844 Douglas Ave.,
Elgin.

HARRISON, C. W., Ringwood.

HOLTGRAVE, M. G., Ariston.

HAEGER, R. E., Algonquin.

HOISINGTON, S. E., Stillman Val-
ley.

HOPPENSTEADT, GEO. W., Good-
enow.

HICKS, O. W., Guernsey, Iowa.

HOY, PETER, Lombard.

HILL, G. C., Baylis.

HAGUE, HARRY S., German Val-
ley.

CHR HANSEN'S LABORATORY,
Little Falls, N. Y.

HARTMAN, W. T., Naperville.

HAYDEN, C. C., Urbana.

HOLLAND, O. E., Warren.

HIRTZELL, H. W., Effingham.

HUSMANN, T. H., Hoffman.

HANER, PHIL., Taylorville.

I

INTERNATIONAL HARVESTER CO., Chicago.
IRISH, H. B., Farina.

J

JUDD, I. R., Aurora.
JANSEN, A. F., Effingham.
JORGENSEN, F. A., Urbana.
JONES, F. E. (Creamery Pkg. Mfg. Co.) Chicago.
JENNINGS, A. A., Chicago (Star Union Lines).
JANES, W. E., Hinsdale.
JOHNSON, ERNEST, Hebron.
JONES, A. H., State Food Commissioner, Chicago.
JACOBSON, P. H., Ridgefarm.
JOHNSON, A. T., Stewardson.
JONES, H. F., Hebron.

K

KELLER, W. O., North Crystal Lake, Ill.
KIRK, W., 324 S. Madison St., Rockford.
KNIGGE, L. H., McHenry, R. 2.
KOCH, ARTHUR, Highland.
KENDALL, GEORGE, Mt. Carroll.
KLECKNER, H. S., Orangeville.
KNOBELock, GEO., Marion.
KNUDSON, WM., Union.
KANE, WM. J., Thomson.
KEMP, J. A., Paxton.
KOCH, ARTHUR, Highland.
KURTZ, G. A., Vandalia.

L

LONG, M., Woodstock.
LICHTHARDT, HERMAN, Roselle.
LYNCH, JOHN T., Olney.
LICHTHARDT, F. H., Roselle, R. 1.
LEHMAN, W. B., West Chicago, R. 4.
LONG, C., Blood's Point.
LUMBARD, J. G., 6624 Wentworth Ave., Chicago.
LEASS, S. L., Sullivan.
LETTS, GEO. D., Frankfort Station.
LIELL, J. M., Edgewood.
LINDLEY, HON. C. J., Greenville.
LLOYD, W. B., Kinmundy.
LOHMEN, WM. C., Sorento, R.R. 2.
LALLY, W. A., Chicago (N. Y. Dispatch Trans. Co.)
LATZER, R. L., Highland.

M

MARTIN, E. E., West Chicago.
MASON, RICHARD, Elgin, R. 3.
MORTON, STERLING, Chicago.
M'CREDIE, WM., Elgin.
MITCHELL, E. N., Morrison.
MATTHEWS, AUGUST.
MOREN, ROBT., Freeport.
M'EWAN, CHAS., Marengo.
MACKEY, L. E., Marengo.
MOORE, E. T., Watseka.
MEYER, M. H., Madison, Wis.
M'LAUGHLIN, J. L., (De Laval Separator Co.) Chicago.
MOSS, W. C., Libertyville.

M

- MASON, J. P., Elgin.
 M'ROBINSON, DUETT, Poplar Grove.
 MENTCH, L. E., Cary.
 M'NAIR, JAS., Winnebago.
 MORTENSON, C. E., Milledgeville.
 MEANS, R. H., Miles, Iowa.
 MALLORY, E. G., Freeport.
 MUSSELMAN, M. L., Lanark.
 MARSEY, H. C., Jerseyville.
 MAULE, A., Shirland.
 MORTON SALT CO., Chicago.
 MILLER, ANTHONY, Streator.
 MOORE, F. S., Woodstock.
 MOORE, E. T., Watseka.
 MORRIS, R. A., Harvard.
 MAURER, W. H., Rock Grove.
 MINGLE, JOHN, Toledo.
 MATTSON, E. J., Morrison.
 MAULE, ARTHUR, Round Grove.
 MOORE, H. L., Strausburg.
 MOLES, F. R., Chicago.
 MORRIS, JOS., Washington.
 MURRAY, OTIS C., Johnsburg.
 MAYER, OTTO, Davis.
 M'NISH, F. J., Chicago (Creamery Package Mfg. Co.)
 MEYER, ADOLPH, Highland.

N

- NIELSEN, LOUIS, Camp Point.
 NEWMAN, JNO. B., Asst. State Food Commissioner, Elgin.
 NOURSE, B., 651 Monadnock Bldg., Chicago.
 NEGUS, A. J., Preston, Iowa.
 NILES, H. B., Decatur.
 NELSON, PETER, Creston.
 NEWBERRY, GEO. L., Mt. Vernon.
 NEWMAN, WALTER, Elgin.
 NILES, N. B., Decatur.
 NEWMAN, JOSEPH, Elgin.

O

- OLSEN, H. P., Milwaukee, Wis.
 OSTDICK, OTTO, Elgin, R. 5, Box 12.
 O'DONNELL, GEO., Bluford.
 OLSON, CHAS., Kirkland.
 OLMSTEAD, C. A., Shipman.
 OLDFIELD, JOS., Vandalia.
 OSGOOD, H. B., Chicago (Creamery Package Mfg. Co.)

P

- POTTER, C. E., Champaign.
 POTTER, CHAS. H., Elgin.
 PFINGSTEN, H. F., Hampshire.
 PFINGSTEN, F. W., McHenry.
 PAGE, C. L., West McHenry.
 PETERSON, N. A., Sigel.
 PETERS, B. K., Dallas City.
 PENNINGTON, R. H., Plainfield.
 PITKIN, T. N., Vandalia.
 PALMER, F. R., Pearl City.
 PATTERSON, J. P., Plainfield.
 PEARSON, WM., Elgin, R. No. 4.
 POWELL, J. W., Peoria (Merchants' Despatch Transportation Co.)
 PENNINGTON, J. S., Plainfield.
 PETERS, DR. A. T., Springfield.

R

RINECKER, GEO., Hampshire.
 ROHLWING, W., Palatine.
 RENNER, C. L., Elgin.
 RATHBURN, J. K., Glen Ellyn.
 REMMINGTON, H. D., Clinton.
 RAWSON, FRANK E., Alden.

RAYNER, J. W., Elgin.
 RICE, H. B., Lewiston.
 RAWSON, F. E., Woodstock, R.
 No. 3.
 RANKIN, WARRE, Greenville.
 ROUSE, H. H., Shobonier.

RYAN, J. D., Brownstown, R. 4.

S

SAUNDERS, C. A., (A. H. Barber
 Creamery Supply Co.) Chicago.
 SNOW, G. B., Elgin.
 SWANSON, OLAF, St. Charles.
 SHUKNECHT, H. E., (Worcester
 Salt Co.) 256 Madison St., Chi-
 cago.
 SCHWAKE, HERMAN, Arlington
 Heights.
 SCHMIDT, HANK (Elgin Butter
 Tub Co.) Elgin.
 SCHMIDT, C. J. (Elgin Butter Tub
 Co.) Elgin.
 SMITH, W. E., Indianapolis, Ind.
 SANBURN, J. W., Spring Grove.
 SANMANN, J. F., Havana.
 SCHMIDT, JACOB, 423 Orchard
 St., Elgin.
 STOXEN, HENRY, Union.
 STOCKER, C., Highland.
 SHILLING, S. B., Chicago.
 SHOOK, V. A. (Sharples Separator
 Co.) Freeport.
 SWATECK, C. W., Cherry Valley.
 SPOHN, A. J., Morrison.
 SIMONSON, GEO., Camp Point.
 SMITH, JACOB, Washington.

SCHWARTZ, H. E., Mt. Vernon.
 SIMONSON, M., New Berlin.
 SPRAGUE, C. N., 707 Van Buren
 St., Joliet.
 SPIES, L. A., Union Dairy Co., St.
 Louis, Mo.
 SHARPLES SEPARATOR CO., Chi-
 cago.

SCHILDMILLER, JNO., Thomson.
 SCOTT, J. E., Scales Mound.
 SHILLING, S. B., Chicago.
 SLOUBORG, THOS., Savanna.
 SMITH, ANDREW, Washington.
 SMITH, D. C., Lake Zurich.
 SMITH, ANDREW, Washington.
 SCHNERDEN, JOE, Union.
 STOXEN, HENRY, Union.
 SCHULTZ, A. M., Shepman.
 SCHUMAKER, JOHN, Altamont.
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